BSR/ASHRAE Addendum d to ANSI/ASHRAE Standard 209-2018

First Public Review Draft


First Public Review Draft (December 2023)
(Draft shows Proposed Changes to Current Standard)

This draft has been recommended for public review by the responsible project committee. To submit a comment on this proposed standard, go to the ASHRAE website at www.ashrae.org/standards-research--technology/public-review-drafts and access the online comment database. The draft is subject to modification until it is approved for publication by the Board of Directors and ANSI. Until this time, the current edition of the standard (as modified by any published addenda on the ASHRAE website) remains in effect. The current edition of any standard may be purchased from the ASHRAE Online Store at www.ashrae.org/bookstore or by calling 404-636-8400 or 1-800-727-4723 (for orders in the U.S. or Canada).

This standard is under continuous maintenance. To propose a change to the current standard, use the change submittal form available on the ASHRAE website, www.ashrae.org.

The appearance of any technical data or editorial material in this public review document does not constitute endorsement, warranty, or guaranty by ASHARE of any product, service, process, procedure, or design, and ASHRAE expressly disclaims such.

© 2023 ASHRAE. This draft is covered under ASHRAE copyright. Permission to reproduce or redistribute all or any part of this document must be obtained from the ASHRAE Manager of Standards, 180 Technology Parkway NW, Peachtree Corners, GA 30092. Phone: 404-636-8400, Ext. 1125. Fax: 404-321-5478. E-mail: standards.section@ashrae.org.

ASHRAE, 180 Technology Parkway, Peachtree Corners, GA 30092
Forward: The addendum expands focus on expanding the applicability of Informative Appendix C and renames the appendix to “Modeling Input for Simple Box and Other Cycles”. The change reflects the use cases of the default assumptions presented into the appendix beyond simple box modeling. Additional changes have been made to clarify the language and standardize how each clause is introduced. The importance of using the assumption only if specific information is not known is now clear in the standard. To expand the usefulness of Appendix C further, Section 3, General Information Resources, has been added. The updates in this addendum to Appendix C will help with the adoption of Standard 209 by adding more resources for modelers looking to complete daily tasks.

INFORMATIVE APPENDIX C
MODELING INPUT FOR SIMPLE BOX MODELING AND OTHER CYCLES

1. Create a simple box model of the project using an energy simulation program. Some programs use preprocessor or expert (“wizard”) systems workflows to help create these models. For simple box models, the energy simulation program may use monthly design day hourly information (288 hour in lieu of 8760 hour simulation).

2. Initial input parameters. Where design parameters or targets of the building are known, those should be used otherwise when creating the model. Design targets can be found in the OPR if available. Otherwise, the following should be used as the assumptions to set input parameters of the model.

2.12 Building type (e.g., assembly, healthcare, hotel/motel, light manufacturing, office, restaurant, retail, school, warehouse, laboratory, etc.). The building type infers information about building program area allocations and locations (core or perimeter space) as well as occupancy and internal load information by program area.

2.23 Building form. If the rough building form has not been otherwise prescribed, follow the parameters given in Table 13 of NREL/TP-5500-46861 “U.S. Department of Energy Commercial Reference Building Models of the National Building Stock.” Aspect ratio is defined as the overall length in the east-west direction divided by the overall length in the north-south direction. If the building type is not one given in Table 13, and no other information is known, use a rectangle with an aspect ratio of 1.62, floor-to-floor height 12.5 ft (3.81 m), flat roof, glazing fraction 30%. Note: The table found in NREL/TP-5500-46861 “U.S. Department of Energy Commercial Reference Building Models of the National Building Stock” is equivalent to the PNNL/DOE prototype buildings.

2.34 Site location by weather file location. See Appendix A Section 5.6 for types and sources of weather files.
2.45 **Total conditioned square footage.** The accuracy of this parameter should be order of magnitude for simple box models.

2.56 **Number of floors, if known.** If not known, use the number of floors given in Table 13 of NREL/TP-5500-46861 referenced above. Unless known otherwise and each of multiple floors shall have the same footprint.

2.62 **Glazing Fenestration amount.** Use if not known, use Table 13 of NREL/TP-5500-46861 or the applicable local energy code or ASHRAE/IES Standard 90.1, Table G3.1.1-1, to define default WWR percent for various according to building types if actual WWR is not known. Allocate percent window-to-wall ratio, by orientation if known, evenly distributed on all faces if not.

2.78 **Internal loads (people lighting, equipment, and lighting people).** If not known, allocate by program area. If unknown, distribute evenly over the conditioned area. Lighting lighting power densities should be the maximum allowed by applicable local energy code. If unknown, use applicable local energy code or Equipment power and occupant densities can be found in ASHRAE/IES Standard 90.1 User’s Manual section C and Appendix G tables, for schedules, equipment power, and occupant densities. Additional information on internal loads and schedules may be found in NREL/TP-5500-46861 Appendices A and B.

2.8 **Schedules.** If not known, ASHRAE/IES Standard 90.1 User’s Manual section C and Appendix G tables, should be used. Additional information on schedules may be found in NREL/TP-5500-46861 Appendices A and B.

2.9 **Ventilation.** If not known, should be in accordance with applicable local building codes. Ventilation rates shall be determined according to ASHRAE Standard 62.1 Ventilation Rate Procedure for commercial buildings, ASHRAE Standard 62.2 for residential buildings outside air rate per occupant, or, and ASHRAE/ASHE Standard 170 for healthcare and laboratory buildings air change rate by usage, whichever is largest.

2.10 **Perimeter/core zoning.** If not known, perimeter zone depth shall should be no greater than 1.5 times floor to floor height.

2.11 **Building envelope assemblies.** If not known, should be in accordance with the applicable local building codes or the baseline performance of ASHRAE/IES Standard 90.1, Table G3.1.5.

2.12 **HVAC System.** If not known, should be determined according to ASHRAE/IES Standard 90.1, Appendix G, baseline HVAC system type is only to be used when sufficient information on the HVAC system has not been provided to the energy modeler. Refer to Appendix C, Section 2.1.

2.13 **Infiltration.** If not known, should be in accordance with applicable local building codes, ASHRAE Handbook - Fundamentals Chapter 16, Table 11, ASHRAE/IES Standard 90.1, Table G3.1.5.b, or established project goals.
3. General Information Resources

<table>
<thead>
<tr>
<th>Source</th>
<th>Name</th>
<th>Link</th>
</tr>
</thead>
<tbody>
<tr>
<td>BEMcyclopedia</td>
<td>Internal Gain and Schedule Lookup Tables</td>
<td><a href="https://apps.bemcyclopedia.com/lookups/">https://apps.bemcyclopedia.com/lookups/</a></td>
</tr>
<tr>
<td>BEMcyclopedia</td>
<td>Simple Box Models Wiki</td>
<td><a href="https://bemcyclopedia.com/wiki/Simple_Box_Models">https://bemcyclopedia.com/wiki/Simple_Box_Models</a></td>
</tr>
<tr>
<td>COMNET</td>
<td>Modeling Guidelines - Reference Appendices</td>
<td><a href="https://www.comnet.org/reference-appendices">https://www.comnet.org/reference-appendices</a></td>
</tr>
</tbody>
</table>