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ANSI/ASHRAE/IBPSA Standard 209-2024
Building Performance Simulation Process

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NOTE

Approved addenda, errata, or interpretations for this standard can be downloaded free of charge from the ASHRAE website at www.ashrae.org/technology.

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FOREWORD

ASHRAE Standard 209 describes a methodology to apply building energy modeling to the design process. The Standard Project Committee recognizes the important role building energy modeling plays in informing the design and operation of low-energy buildings. This standard was created to define reliable and consistent procedures that advance the use of timely energy modeling to quantify the impact of design decisions at the point in time at which they are being made. The committee believes such an approach will improve modeling effectiveness, realize greater savings, and support achieving increasingly aggressive energy savings targets.

The standard defines general modeling requirements coupled with eleven modeling cycles, each with specific modeling goals that align with distinct phases of the design, construction, or operation process. Each modeling cycle is an extension of the general modeling requirements, which represents a best-practices approach for using modeling to inform design. Seven of the modeling cycles coincide with the building design phase, three modeling cycles are applied during building construction, and one occurs postoccupancy. The postoccupancy analysis is included to help both the owner and modeler understand how modeled results compare to actual energy performance to inform operation and assumptions used in future modeling projects.

The minimum requirements of the standard can be met by completing a load-reducing modeling cycle early in the design process, as well as one additional design-phase modeling cycle. The full set of modeling cycles were developed to provide holistic modeling guidance and are included for completeness. They can be selectively adopted by organizations that desire a more robust treatment for realizing their specific project objectives. While the standard can be applied with any design process, it is best utilized when included as part of an integrative design process.

The first version of the standard, published in 2018, has been referenced by AIA, USGBC, ICC, IBPSA-USA, ASHRAE, and others. It is expected the standard will be continue to be adopted by organizations that certify high-performance buildings, as well as by utilities and agencies that provide incentives for using modeling to inform design. It can be referenced as part of a project scope of work by building owners and architects seeking an effective, uniform way to use energy modeling to achieve performance objectives.

The 2024 edition of the standard includes the following changes:

a. Updates to allow for greater inclusion of qualified modelers
b. Revised terminology and expansion of the title, purpose, and scope
c. Adds new informative appendices for predictive energy modeling, guidance in design, future climate analysis, and level of detail for model inputs
d. Updates to existing appendices on modeling inputs and benchmark information
e. Revisions to Modeling Cycles #1 Simple Box Modeling, #2 Conceptual Design Modeling, #3 Load Reduction Modeling, #7 Responsive Design Alternative Modeling, and #11 and Operational Energy Performance Comparison
f. Updates to general requirements for modeling cycles in Section 5

For a complete list of changes, see Informative Appendix K.

1. PURPOSE

To establish minimum requirements for the process of using simulation to evaluate building performance and inform decision making.

2. SCOPE

This standard applies to the use of building performance simulation, including *energy modeling*, during the design, construction, and operation of new buildings or major renovations of, or additions to, existing buildings.

3. DEFINITIONS, ABBREVIATIONS, AND ACRONYMS

3.1 General

Certain terms, abbreviations, and acronyms are defined in this section for the purposes of this standard. These definitions are applicable to all sections of this standard.

3.2 Definitions

actual meteorological year (AMY): a data set comprising one year of historical, hourly measured or derived weather observations for a specific location.