BSR/ASHRAE/IES Addendum ce
to ANSI/ASHRAE/IES Standard 90.1-2022

Public Review Draft

Proposed Addendum ce to Standard 90.1-2022, Energy Standard for Sites and Buildings Except Low-Rise Residential Buildings

First Public Review (March 2025)
(Draft Shows Proposed Changes to Current Standard)

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FOREWORD

The intent of the original language related to rotating the baseline model four times was to provide an incentive for good orientation of a building's facades with large window areas. Along with this was the concept that rotating a building is generally simple to do in most simulation programs by simply changing the overall orientation of the building and rerunning the simulation. The existing language has been interpreted by some people to mean that all the rules of creating a baseline are repeated for each rotation, essentially exercising the Appendix G rules four times but that creates additional work and may be counter to the original intent of rewarding good orientation. Most modelers follow this original intent already and now more clearly reflected in the language being changed. Of four software program vendors that were contacted that provide some automation for Appendix G, three of them were supportive of the proposed clarification. Similar changes were made in Section 12 and Appendix C. In addition, a change to how the shading should be performed to provide incentives for buildings intending to shade themselves has been added.

[Note to Reviewers: This addendum makes proposed changes to the current standard. These changes are indicated in the text by underlining (for additions) and ~~strikethrough~~ (for deletions) except where the reviewer instructions specifically describe some other means of showing the changes. Only these changes to the current standard are open for review and comment at this time. Additional material is provided for context only and is not open for comment except as it relates to the proposed changes.]

Addendum ce to 90.1-2022

Revise Table 12.5.1, Part 5 Building Envelope, Budget Column as follows:

d. No shading projections are to be modeled. *Manual fenestration* shading devices such as blinds or shades are not required to be modeled. *Automatically* controlled *fenestration* shading devices shall not be modeled. *Fenestration* shall be assumed to be flush with the wall or roof. If the fenestration area for new buildings or additions exceeds the maximum allowed by Section 5.5.4.2, the area shall be reduced proportionally along each exposure until the limit set in Section 5.5.4.2 is met. If the vertical fenestration area facing west or east of the proposed design exceeds the area limit set in Section 5.5.4.5 then the energy cost budget shall be ~~generated by simulating the budget building design with its actual orientation and again after rotating the entire budget building design 90, 180, and 270 degrees and then averaging the results.~~ calculated by averaging the results from simulating the *budget building design* with its actual *orientation* and again after rotating the entire building model 90, 180, and 270 degrees. Changes to the building azimuth, or azimuths of all surfaces, shall be made for the building model for the 90, 180, or 270

degree simulations. Changes to the equipment capacities, air-flow rates, and water-flow rates shall be made for the building model for the 90, 180, or 270 degree simulations for those modeling inputs sized by the simulation software. No other changes to the building model for the 90, 180, or 270 degree simulations shall be made. All budget rules, including HVAC system type and equipment efficiencies, shall be determined based solely on the *building's* actual orientation. The *building* shall be modeled so that it does not shade itself. Fenestration U-factor shall be equal to the criteria from Tables 5.5-0 through 5.5-8 for the appropriate climate, and the SHGC shall be equal to the criteria from Tables 5.5-0 through 5.5-8 for the appropriate climate. For portions of those tables where there are no SHGC requirements, the SHGC shall be equal to that determined in accordance with Section C3.6(d). The VT shall be equal to that determined in accordance with Section C3.6(d). The fenestration model for building envelope alterations shall reflect the limitations on area, U-factor, and SHGC as described in Section 5.1.4.

Revise Section C3.6 as follows:

C3.6(d)(2) Where the fenestration area facing west or east of the proposed design exceeds the area limit set in Section 5.5.4.5, the baseline building performance shall be generated by simulating the building with its actual orientation and again after rotating the entire building 90, 180, and 270 degrees and averaging the results of the four simulations. The *base envelope performance factor* shall be calculated by averaging the results from simulating the *proposed design* with its actual *orientation* and again after rotating the entire building model 90, 180, and 270 degrees. Changes to the building azimuth, or azimuths of all surfaces, shall be made for the building model for the 90, 180, or 270 degree simulations. Changes to the equipment capacities, air-flow rates, and water-flow rates shall be made for the building model for the 90, 180, or 270 degree simulations for those modeling inputs sized by the simulation software. No other changes to the building model for the 90, 180, or 270 degree simulations shall be made. All rules for determining the *base envelope performance factor* shall be determined based solely on the *building's* actual orientation.

Revise Table G3.1, Part 5 Building Envelope, Baseline Column as follows:

a. Orientation. The *baseline building performance* shall be ~~generated by simulating the *building* with its actual *orientation* and again after rotating the entire *building* 90, 180, and 270 degrees, then averaging the results.~~ calculated by averaging the results from simulating the *baseline building design* with its actual *orientation* and again after rotating the entire *building* model 90, 180, and 270 degrees. Changes to the building azimuth, or azimuths of all surfaces, shall be made for the building model for the 90, 180, or 270 degree simulations. Changes to the equipment capacities, air-flow rates, and water-flow rates shall be made for the building model for the 90, 180, or 270 degree simulations for those modeling inputs sized by the simulation software. No other changes to the building model for the 90, 180, or 270 degree simulations shall be made. All baseline rules, including HVAC system type and equipment efficiencies, shall be determined based solely on the *building's* actual orientation. The *building* shall be modeled so that it does not shade itself nor be shaded by any adjacent buildings, site topography, or local shading devices.
Exceptions:
1. If it can be demonstrated to the satisfaction of the *rating authority* that the *building orientation* is dictated by site considerations.
2. *Buildings* where the *vertical fenestration area* on each *orientation* varies by less than 5%.