



**BSR/ASHRAE/IES Addendum ad  
to ANSI/ASHRAE/IES Standard 90.1-2022**

**Public Review Draft**

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

**First Public Review (April 2024)  
(Draft Shows Proposed Changes to Current Standard)**

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## FOREWORD

This addendum involves updating the standard to replace three terms, *Code Official*, *Building Official*, and *Authority Having Jurisdiction*, with a single term and modified definition of *Authority Having Jurisdiction*. Standard 90.1-2022 uses all three terms throughout the standard. The proposed changes simplify the standard by deleting two of the three terms and providing one term with a common definition.

The changes noted herein delete building official and code official as defined terms and include them in a modified single definition of *Authority Having Jurisdiction*, shown as *AHJ* throughout.

*[Note to Reviewers: This addendum makes proposed changes to the current standard. These changes are indicated in the text by underlining (for additions) and ~~striketrough~~ (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 ad to 90.1-2022

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*Modify the standard as follows (IP and SI Units)*

*Revise Section 3.2 as shown (IP and SI Units)*

[ ... ]

*authority having jurisdiction (AHJ):* the agency, ~~or~~ agent, building official, code official, governmental entity, or designated authority responsible for administering and enforcing this standard.

[ ... ]

~~*building official:* the officer or other designated authority having jurisdiction charged with the administration and enforcement of this standard, or a duly authorized representative.~~

[ ... ]

~~*code official:* see building official.~~

[ ... ]

*Revise Section 4.2.2 as shown (IP and SI Units)*

[ . . . ]

**4.2.2.1 Construction Details.** Compliance documents shall show all the pertinent data and features of the *building, equipment, and systems* in sufficient detail to permit a determination of compliance by the ~~building official~~ *authority having jurisdiction (AHJ)* and to indicate compliance with the requirements of this standard.

**4.2.2.2 Supplemental Information.** Supplemental information necessary to verify compliance with this standard, such as calculations, worksheets, compliance forms, vendor literature, or other data, shall be made available when required by the ~~building official~~ *AHJ*.

**4.2.4 Inspections.** All *building construction, additions, or alterations* work subject to the provisions of this standard shall remain accessible and exposed for inspection purposes until approved in accordance with the procedures specified by the ~~building official~~ *AHJ*. The ~~building official~~ *AHJ*, upon notification, shall make the inspections set forth in Section 4.2.4.1 through 4.2.4.6.

**4.2.4.6 Other Inspections.** Other inspections related to mechanical, plumbing, lighting, and other *equipment* shall be inspected in accordance with the compliance path selected in Section 4.2.1 and approved documentation provided in Section 4.2.2, or as otherwise required by the ~~building official~~ *AHJ*.

**4.2.5.1 Building Systems Verification and Testing Requirements.** Verification or *functional performance testing (FPT)* to confirm compliance with required provisions of this standard shall be performed on *building systems, controls, and the building envelope*, as required by Sections 5.9.1, 6.9.1, 7.9.1, 8.9.1, 9.9.1, 10.9.1, 12.2(e), and G1.2.1(e). Where testing is required but specific *FPT* procedures are not specified in this standard, testing shall use *generally accepted engineering standards* acceptable to the ~~building official~~ *AHJ*.

**4.2.5.1.2 FPT and Verification Documentation.** The completed verification and *FPT* documentation shall include the results of the *FPT* and verification, be provided to the owner, and be retained with the project records. The *V&T providers* shall certify completion of required verification and *FPT* and include a plan for the completion of any deferred *FPT*, including climatic and other conditions required for performance of the deferred tests. A copy of verification and *FPT* documentation shall be submitted to the ~~building official~~ *AHJ* if requested.

**4.2.5.2 Building Commissioning Requirements.** *Commissioning* shall be performed in accordance with this section and Sections 5.9.2, 6.9.2, 7.9.2, 8.9.2, 9.9.2, 10.9.2, 12.2(e), and G1.2.1(f). *Commissioning* shall use ASHRAE/IES Standard 202 or other *generally accepted engineering standards* acceptable to the ~~building official~~ *AHJ*. *FPT* and verification requirements for *commissioning* are as stated in Section 4.2.5.1. *Commissioning* shall also document in sufficient detail compliance of the *building systems, controls, and building envelope* with required provisions of this standard. *Commissioning* requirements shall be incorporated into the *construction documents*.

**4.2.5.2.1 Commissioning Activities Prior to Building Permit Issuance.** The following activities shall be completed prior to issuance of a *building* permit:

- a. A copy of the *commissioning* plan shall be submitted to the owner. A copy of the *commissioning* plan shall be submitted with the *building* permit application if requested by the ~~building official~~ *AHJ*.

**4.2.5.2.2 Project Commissioning Documents.** Project *commissioning* documents shall comply with ASHRAE/IES Standard 202 or other *generally accepted engineering standards* acceptable to the ~~building official~~ *AHJ*. The *commissioning provider* shall certify completion of the required *commissioning process* and provide the following documents to the owner and design teams:

**4.2.5.3 Activities Prior to Building Occupancy.** Before issuance of a certificate of occupancy, the *V&T providers* or *commissioning provider* shall complete the following activities:

[...]

- c. The owner shall provide the *building-official AHJ* with one of the following:
  1. A letter of transmittal acknowledging that the *building* owner or owner's authorized agent has received and accepted all required verification documentation, *FPT* documentation, and required preliminary *commissioning* report.
  2. A copy of the reports listed in Section 4.2.5.3(b), if requested by the *building-official AHJ*

[...]

*Revise Section 5.1 as shown (IP and SI Units)*

[...]

**5.1.5.1 United States Locations.** For locations in the United States and its territories, use ASHRAE Standard 169, Table B-1, "U.S. Climate Zones by State and County," to determine the assigned climate zone and, where required, the assigned climate zone letter.

**Exception to 5.1.5.1:** If there are recorded historical climatic data available for a *construction site*, they may be used to determine compliance if approved by the *building-official AHJ*.

**5.1.6.3 Spaces** shall be assumed to be *conditioned spaces* and shall comply with the requirements for *conditioned spaces* at the time of *construction*, regardless of whether mechanical or electrical *equipment* is included in the *building* permit application or installed at that time.

**Exception to 5.1.6.3:** A *space* may be designated as either a *semiheated space* or an *unconditioned space* only if approved by the *building-official AHJ*.

[...]

*Revise Section 5.4 as shown (IP and SI Units)*

[...]

**5.4.3.1.4 Measured Air Leakage.** Where measured *air leakage* is used for compliance, the rate of *air leakage* of the *building envelope* shall not exceed 0.35 cfm/ft<sup>2</sup> under a pressure differential of 75 Pa (0.30 in. of water), with this *air leakage* rate normalized by the sum of the above-grade and below-grade *building envelope* areas of the *conditioned space* and *semiheated space* and in accordance with this section.

[...]

- c. Where the measured *air leakage* rate exceeds 0.35 cfm/ft<sup>2</sup> but does not exceed 0.45 cfm/ft<sup>2</sup>, a diagnostic evaluation, such as a smoke tracer or infrared imaging, shall be conducted while the *building* is pressurized, and any leaks noted shall be sealed if such sealing can be made without destruction of *existing building* components. In addition, a visual inspection of the air barrier shall be conducted, and any leaks noted shall be sealed if such sealing can be made without destruction of *existing building* components. An additional report identifying the corrective actions taken to seal leaks shall be submitted to the *code-official AHJ* and the *building* owner and shall be deemed to satisfy the requirements of this section.

[...]

*Revise Section 5.5 as shown (IP and SI Units)*

[ . . . ]

**5.5.3 Opaque Elements.** For all *opaque* elements, compliance with Tables 5.5-0 through 5.5-8 for each *class of construction* as described in Normative Appendix A, Sections A2 through A8 shall be demonstrated by one of the following two methods:

- a. Providing a minimum *rated R-value of insulation* added to the assembly equal to or greater than the insulation minimum *R-value* required of each insulation component.
- b. Providing insulation such that the maximum *U-factor*, *C-factor*, or *F-factor* for the entire assembly is not exceeded as determined by one of the following:
  1. Precalculated values in accordance with Normative Appendix A, Section A1.1.
  2. Applicant-determined values in accordance with Normative Appendix A, Section A1.2 where such values are approved by the ~~code official~~ *AHJ*.

**Exceptions to 5.5.3:**

For *opaque* assemblies not complying with the *classes of construction* as described in Normative Appendix A, Sections A2 through A8, compliance with the maximum *U-factors* for the “attic and other” or “wood frame and other” *opaque* element conditions in Tables 5.5-0 through 5.5-8 shall be demonstrated by testing or calculations representative of the designed assembly in accordance with Normative Appendix A, Section A9.1 where approved by the ~~code official~~ *AHJ*.

[ . . . ]

*Revise Section 6.5 as shown (IP and SI Units)*

[ . . . ]

**6.5.3.1.2 Fan Motor Selection**

- a. For each fan less than 6 *bhp*, the selected fan motor shall be no larger than the first available motor with a *nameplate rating* greater than 1.5 times the *fan bhp*.
- b. For each fan 6 *bhp* and larger, the selected fan motor shall be no larger than the first available motor with a *nameplate rating* greater than 1.3 times the *fan bhp*.

The *fan bhp* must be indicated on the design documents to allow for compliance verification by the ~~building official~~ *AHJ*.

[ . . . ]

*Revise Section 10.5.1.4 (added by published Addendum k) as shown (IP and SI Units)*

**10.5.1.4 Renewable Energy Certificate Purchase.** Where it can be demonstrated to the ~~code official~~ *AHJ* that the requirements of Sections 10.5.1.1 through 10.5.1.3 or a combination of the three cannot be met, either in part or full, and prior to the issuance of the certificate of occupancy, the building owner shall document a contract for delivery of renewable energy certificates certified in compliance with the Green-e® Renewable Energy Standard for Canada and the United States, or an equivalent *approved* standard, equal to three times the amount of total off-site renewable energy calculated in accordance with Section 10.5.1.3.

[ . . . ]

*Revise Section 12.5 as shown (IP and SI Units)*

**12.5.2 HVAC Systems.** The *HVAC system* type and related performance parameters for the *budget build- ing design* shall be determined from Figure 12.5.2, the *system* descriptions in Table 12.5.2-1 and accompanying notes, and the following rules:

- i. **Equipment Capacities.** The *equipment* capacities for the *budget building design* shall be sized proportionally to the capacities in the *proposed design* based on sizing runs, i.e., the ratio between the capacities used in the annual simulations and the capacities determined by the sizing runs shall be the same for both the *proposed design* and *budget building design*. Where multiple *HVAC zones* are combined into a single *thermal block* or modeled as identical *thermal blocks* to which multipliers are applied in accordance with Table 12.5.1, the *equipment* capacities for the *budget building design* shall be determined as follows:

1. For budget system Types 8 and 10, *equipment* capacity shall be 9000 Btu/h.
2. For budget system Types 5, 6, 7, 9, and 11, equipment capacity shall be based on the load of the thermal block divided by the number of combined HVAC zones.
3. For budget system Types 1, 2, 3, and 4, equipment capacity shall be based on the total load of all associated thermal blocks, including multipliers, divided by the total number of corresponding HVAC systems specified in the design documents.

*Unmet load hours* for the *proposed design* or *baseline building designs* shall not exceed 300 hours (of the 8760 hours simulated). The *unmet load hours* for the *proposed design* shall not exceed the *unmet load hours* for the *budget building design*. Alternatively, *unmet load hours* exceeding these limits may be approved by the *building official AHJ*, provided that sufficient justification is given indicating that the accuracy of the simulation is not significantly compromised by these unmet loads.

[ ... ]

*Revise Section 13.7 as shown (IP and SI Units)*

[ ... ]

**13.7.2 Permit Application Documentation.** Compliance shall be documented and submitted to the *building official AHJ*. The information submitted shall include the following:

[ ... ]

- p. Simulation input files for the *budget building design* and the *proposed design* shall be made available if requested by the *building official AHJ*.

[ ... ]

*Revise Normative Appendix G Performance Rating Method as shown (IP and SI Units)*

[ ... ]

**G1.1 Performance Rating Method Scope.** This appendix offers an alternative path for minimum standard compliance in accordance with Section 4.2.1.1 when administered by a *building official an AHJ*. It is also provided for those who wish to use this appendix to quantify performance that exceeds the requirements of this standard when administered by a *rating authority* and not seeking minimum standard compliance in accordance with Section 4.2.1.1. It shall be used for evaluating the performance of all such *proposed designs*, including *alterations* and *additions* to *existing buildings*, except designs with no mechanical *systems*. In the case where this appendix is administered solely by a *an building official AHJ* to determine compliance with this standard in accordance with Section 4.2.1.1, all references to “*rating authority*” shall be replaced with “*building official AHJ*”

**G1.3.2 Application Documentation.** The following documentation shall be submitted to the *rating authority*:

[ ... ]

- s. Simulation input files for the *budget building design* and the *proposed design* shall be made available if requested by the *building official AHJ*.

[ ... ]

*Revise Informative Appendix H as shown (IP and SI Units)*

[ ... ]

**H5.3 Commissioning Plan (See Section 4.2.5.2.2).** The *commissioning* plan is a document developed by a *commissioning provider* that supports the *energy efficiency* goals of Standard 90.1 by clarifying the *commissioning* activities throughout the design and *construction* process and how they are integrated into design team and contractor activities. The *commissioning* plan is also useful in providing the ~~building-official AHJ~~ with assurance that required *commissioning* activities will be performed.

**H5.8 Preliminary Commissioning Report (See Section 4.2.5.2.2).** A preliminary *commissioning* report is provided by the *commissioning provider* and includes the results of the *commissioning* activities up to the time of occupancy. The results of *FPT* and other verification is included. The preliminary *commissioning* report supports the *energy efficiency* goals of Standard 90.1 by identifying that control sequences related to energy efficiency are working properly, the *commissioning* plan is useful in providing the ~~building-official AHJ~~ with assurance that required are in place, where the ~~building-official AHJ~~ may not have to time or expertise to investigate proper operation. Issues that are unresolved are also identified, as are items that will be tested after occupancy.

[ ... ]

*Revise Normative Appendix L as shown (IP and SI Units)*

**L2.1.6 TSPR Submittals.** Where  $TSPR_p$  and  $TSPR_r$  are used to demonstrate compliance in accordance with Section 6.6.2, documentation shall be provided to the ~~building-official AHJ~~ including the following:

[ ... ]

**L3.2 TSPR Simulation Program.** All components of the *proposed design* for blocks served by *HVAC systems* using this method shall be explicitly modeled by the *simulation program*. The ~~code-official AHJ~~ shall be permitted to approve a *simulation program* for a specified application or limited scope.

**L3.2.1 Minimum Capability.** The *simulation program* shall be approved by the ~~code-official AHJ~~ and shall, at a minimum, have the ability to **explicitly** model all of the following:

[ ... ]

[ ... ]