



**BSR/ASHRAE/IES Addendum as
to ANSI/ASHRAE/IES Standard 90.1-2016**

Public Review Draft

Proposed Addendum as to Standard 90.1-2016, Energy Standard for Buildings Except Low-Rise Residential Buildings

**Second Public Review (February 2019)
(Draft Shows Proposed Independent Substantive
Changes to Previous Public Review Draft)**

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FOREWORD

This second public review includes minor changes to address comment responses.

[Note to Reviewers: This public review draft makes proposed independent substantive changes to the previous public review draft. 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 previous draft 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 substantive changes.]

Addendum as to 90.1-2016

Modify the standard as follows (IP and SI Units)

INFORMATIVE APPENDIX I:

ADDITIONAL GUIDANCE FOR VERIFICATION, TESTING, AND COMMISSIONING

This appendix provides guidance on best practices for stand-alone *functional performance testing (FPT)* and *commissioning* processes (including *FPT*) that relate to Sections 4.2.5, 5.9, 6.9, 7.9, 8.9, 9.9, 10.9, 11.2(d), and G1.21(c) of Standard 90.1. This appendix also contains informative information on the typical overall *commissioning* process—that goes beyond the requirements of Standard 90.1. It also addresses how to integrate suggested *commissioning* and testing activities that are specific to ANSI/ASHRAE/IES Standard 90.1 required controls, *systems* and assemblies into the typical *commissioning* process. The requirements for verification, testing, and *commissioning* in Standard 90.1 are focused specifically on direct support of Standard 90.1 requirements; however, there are additional items often included in a more comprehensive *commissioning* process that support Standard 90.1 requirements, with these examples:

- *Commissioning* building envelope moisture integrity is not required by Standard 90.1; however, preventing moisture damage to the envelope assembly ~~and especially insulation~~ supports the goals of Standard 90.1.

- *Commissioning* HVAC controls to ensure comfort is not required by Standard 90.1; however, controls that maintain comfort properly result in longer term operation of automatic energy efficiency control elements that support the goals of Standard 90.1.
- *Commissioning* daylight responsive controls beyond functional testing of stepped lighting reduction for energy efficiency is not required by Standard 90.1; however, designing and *commissioning* a continuous dimming daylight system with non-distracting operation and proper illumination levels would reduce occupant disruption or complaints and helps ensure the longevity of the savings provided by the Standard 90.1 daylight responsive control requirements.

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I.2. Standard 90.1 items to include in Verification, Testing, or Commissioning

Table I3 lists *systems* and requirements included in Standard 90.1 that can benefit from a verification or *commissioning* process. The Standard 90.1 section number and title is included, along with a list of suggested “items to verify” in that section. There are specific verification, *commissioning* or testing activities required by Standard 90.1 in Sections 4.2.5, 5.9, 6.9, 7.9, 8.9, 9.9, 10.9, 11.2(d), and G1.21I. Table I3 lists only the items in Standard 90.1 that would be beneficial to include in a *commissioning* scope. While these requirements cover many of the *building* components, they are not comprehensive, and there are benefits available from additional *commissioning* or testing. There are other items outside the scope of Standard 90.1 that would typically be included in a *commissioning* scope that are not covered here, but that may improve the quality and reliability of the *building systems* and assemblies.

The suggested *commissioning* activities are intended to be included in a *commissioning* scope based on the building Owner’s perception of desired outcomes relative to the particular building program and location and based on the experience of the commissioning provider. The activities are summarized in a checklist format and are related to the requirements that are described in the noted Subsections of Standard 90.1. The scope of the items to verify should include verification of compliance with Standard 90.1 requirements by documenting each item’s applicability, inclusion or exception. Included items should be verified for installation, proper configuration and operation. Depending on the comprehensiveness of the *commissioning* effort, verification for certain items may be included at the design or construction phase or both. Verification that the design and construction meet the requirements of the chosen compliance path in Standard 90.1 could be completed using the verification and compliance forms from the *Standard 90.1 User’s Manual*.