



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

Public Review Draft

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

**First Public Review (November 2018)
(Draft Shows Proposed Changes to Current Standard)**

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(This foreword is not part of this standard. It is merely informative and does not contain requirements necessary for conformance to the standard. It has not been processed according to the ANSI requirements for a standard and may contain material that has not been subject to public review or a consensus process. Unresolved objectors on informative material are not offered the right to appeal at ASHRAE or ANSI.)

FOREWORD

1. Sections G3.1.1 and G3.1.2.4 are updated to clarify that they apply to HVAC zones and not individual spaces within a zone.
2. The G3.1.1 and G3.1.3.2 are updated to fix the language remaining from when the baseline heating source was determined by the proposed building heating source which is no longer applicable.
3. Section G3.1.1 is updated in response to user feedback to clarify that when determining if certain zones in a building require a separate baseline HVAC system type from the rest of the building, that decision is dependent on differences in internal gain.
4. The redundant footnotes to Tables 4.2.1.1, G3.1.1-1 and G3.4-1 to G3.4-8 are removed.
5. In section G3.1.3, a number of errors are corrected in the title headings for the subsections, where incorrect system numbers are listed as being applicable.

This addendum impacts an optional performance path in the standard designed to provide increased flexibility and therefore was not subjected to cost effectiveness analysis.

[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 bu to 90.1-2016

Revise the Standard as follows (IP Units)

Table 4.2.1.1 Building Performance Factor (BPF)

Building Area Type ^a	Climate Zone																	
	0A and 1A	0B and 1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8	

a. In cases where both a general building area type and a specific building area type are listed, the specific building area type shall apply

G3.1.1 Baseline HVAC System Type and Description

HVAC systems in the baseline building design shall comply with the following:

...

b. Use additional system types for nonpredominant conditions (i.e., residential/nonresidential ~~or heating source~~) if those conditions apply to more than 20,000 ft² (1900 m²) of conditioned floor area.

c. If the baseline HVAC system type is 5, 6, 7, 8, 9, 10, 11, 12, or 13 use separate *single-zone systems* conforming with the requirements of *system 3* or *system 4* (~~depending on building heating source~~) for any *spaces HVAC zones* that have occupancy, ~~or process loads~~ internal gains, or schedules that differ significantly from the rest of the ~~building HVAC zones served by the system. The total Ppeak thermal internal gains loads~~ spaces HVAC zones served by the system, or schedules that differ by more than 40 equivalent full-load hours per week from other ~~spaces HVAC zones~~ spaces HVAC zones served by the system, are considered to differ significantly. Examples where this exception may be applicable include but are not limited to natatoriums and continually occupied security areas. This exception does not apply to *computer rooms*.

.....

f. If the baseline HVAC system type is 9 or 10, use additional system types for all spaces HVAC zones that are mechanically cooled in the *proposed design* ~~shall be assigned to a separate baseline system by using the area and heating source of the mechanically cooled spaces.~~

G3.1.3.2 Type and Number of Boilers (Systems 1, 5, and 7, 11, and 12)

The boiler plant ~~shall use the same fuel as the proposed design~~ and shall be natural draft, except as noted in Section [G3.1.1.1](#). The *baseline building design* boiler plant shall be modeled as having a single boiler if the *baseline building design* plant serves a conditioned floor area of 15,000 ft² (1400 m²) or less, and as having two equally sized boilers for plants serving more than 15,000 ft² (1400 m²). Boilers shall be staged as required by the load.

G3.1.3.3 Hot-Water Supply Temperature (Systems 1, 5, 7, 11, and 12)

G3.1.3.6 Piping Losses (Systems 1,5, 7, 8, and 11, 12, and 13)

G3.1.3.10 Chilled-Water Pumps (Systems 7, 8, and 11, 12, and 13)

G3.1.3.11 Heat Rejection (Systems 7, 8, 9, 11, 12, and 13)

G3.1.3.12 Supply Air Temperature Reset (Systems 5 through 8 and 11)

Table G3.1.1-1 Baseline Building Vertical Fenestration Percentage of Gross Above-Grade-Wall Area

Building Area Types ^a	Baseline Building Gross Above-Grade-Wall Area
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a. In cases where both a general building area type and a specific building area type are listed, the specific building area type shall apply.

Table G3.4-1 Performance Rating Method Building Envelope Requirements for Climate Zones 0 and 1 (A,B)*

	Nonresidential	Residential	Semiheated
Opaque Elements	Assembly Maximum	Assembly Maximum	Assembly Maximum
Roofs			

*The following definitions apply: c.i. = continuous insulation (see Section 3.2), NR = no (insulation) requirement.
 a. Exception to Section A3.1.3.1 applies.

Table G3.4-2 Performance Rating Method Building Envelope Requirements for Climate Zone 2 (A,B)*

	Nonresidential	Residential	Semiheated
Opaque Elements	Assembly Maximum	Assembly Maximum	Assembly Maximum
Roofs			

*The following definitions apply: c.i. = continuous insulation (see Section 3.2), NR = no (insulation) requirement.
 a. Exception to Section A3.1.3.1 applies.

Table G3.4-3 Performance Rating Method Building Envelope Requirements for Climate Zone 3 (A,B,C)*

	Nonresidential	Residential	Semiheated
Opaque Elements	Assembly Maximum	Assembly Maximum	Assembly Maximum
Roofs			

*The following definitions apply: c.i. = continuous insulation (see Section 3.2), NR = no (insulation) requirement.
 a. Exception to Section A3.1.3.1 applies.

Table G3.4-4 Performance Rating Method Building Envelope Requirements for Climate Zone 4 (A,B,C)*

	Nonresidential	Residential	Semiheated
Opaque Elements	Assembly Maximum	Assembly Maximum	Assembly Maximum
Roofs			

*The following definitions apply: c.i. = continuous insulation (see Section 3.2), NR = no (insulation) requirement.
 a. Exception to Section A3.1.3.1 applies.

Table G3.4-5 Performance Rating Method Building Envelope Requirements for Climate Zone 5 (A,B,C)*

Opaque Elements	Nonresidential	Residential	Semiheated
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	Assembly Maximum	Assembly Maximum	Assembly Maximum
Roofs			

*The following definitions apply: c.i. = *continuous insulation* (see Section 3.2); NR = no (insulation) requirement.
a. Exception to Section 3.1.3.1 applies.

Table G3.4-6 Performance Rating Method Building Envelope Requirements for Climate Zone 6 (A,B)*

	Nonresidential	Residential	Semiheated
Opaque Elements	Assembly Maximum	Assembly Maximum	Assembly Maximum
Roofs			

*The following definitions apply: c.i. = *continuous insulation* (see Section 3.2); NR = no (insulation) requirement.
a. Exception to Section 3.1.3.1 applies.

Table G3.4-7 Performance Rating Method Building Envelope Requirements for Climate Zone 7 *

	Nonresidential	Residential	Semiheated
Opaque Elements	Assembly Maximum	Assembly Maximum	Assembly Maximum
Roofs			

*The following definitions apply: c.i. = *continuous insulation* (see Section 3.2); NR = no (insulation) requirement.
a. Exception to Section 3.1.3.1 applies.

Table G3.4-8 Performance Rating Method Building Envelope Requirements for Climate Zone 8 *

	Nonresidential	Residential	Semiheated
Opaque Elements	Assembly Maximum	Assembly Maximum	Assembly Maximum
Roofs			

*The following definitions apply: c.i. = *continuous insulation* (see Section 3.2); NR = no (insulation) requirement.
a. Exception to Section 3.1.3.1 applies.