

**ERRATA SHEET FOR
ANSI/ASHRAE/IES STANDARD 90.1-2022 (I-P Edition)
Energy Standard for Sites and Buildings Except Low-Rise Residential Buildings**

April 9, 2025

The corrections listed in this errata sheet apply to ANSI/ASHRAE/IES Standard 90.1-2022, I-P Edition. The first printing is identified on the outside back cover of the standard as “Product code: 86327 12/22”. Shaded items have been added since the previously published errata sheet dated March 25, 2025 was distributed.

NOTICE: ASHRAE now has a list server for Standing Standards Project Committee 90.1 (SSPC 90.1). Interested parties can now subscribe and unsubscribe to the list server and be automatically notified via e-mail when activities and information related to the Standard and the User’s Manual is available. To sign up for the list server please visit **Project Committee List Servers for Standard** on the Technology / Standards section of the ASHRAE website at <https://www.ashrae.org/technical-resources/standards-and-guidelines/project-committee-list-servers>.

Page(s) Erratum

2 **Foreword.** Make the following change to Building Envelope.
(Note: Additions are shown in underline and deletions are shown in ~~strikethrough~~.)

Building Envelope

- A requirement was added to perform whole-building air-leakage testing and measurement on buildings less than ~~25,000~~ 10,000 ft².

45 **5.4.3.4 Vestibules and Revolving Doors.**
(Note: Deletions are shown in ~~strikethrough~~.)

5.4.3.4 Vestibules and Revolving Doors. Vestibules and revolving *doors* shall be installed in accordance with this section.

[...]

5.4.3.4.3 Vestibule Envelope. The exterior surfaces of both conditioned vestibules and unconditioned vestibules shall comply with the *continuous air barrier* requirements.

Exceptions to 5.4.3.4.3:

[...]

71 **6.1.4 Alterations to Heating, Ventilating, Air Conditioning, and Refrigeration in Existing Buildings.**
(Note: Deletions are shown in ~~strikethrough~~.)

6.1.4 Alterations to Heating, Ventilation, Air Conditioning, and Refrigeration in Existing Buildings

6.1.4.1 New HVACR *equipment* as a direct replacement of existing HVACR *equipment* shall comply with the following sections as applicable for the *equipment* being replaced:

[...]

6.1.4.5 New and replacement *pipng* shall comply with Section 6.4.4.1.

Exceptions to 6.1.4.5: Compliance shall not be required
[...]

78 **6.4.3.4.3 Damper Leakage.** Revise Section 6.4.3.4.3 as shown below.
(Note: Additions are shown in underline and deletions are shown in ~~strikethrough~~.)

6.4.3.4.3 Damper Leakage. Where *outdoor air* supply and exhaust/relief dampers are required by Section ~~6.4.3.4.6~~ 6.4.3.4.1, they shall have a maximum leakage rate as indicated in Table 6.4.3.4.3.

131/132 **Table 6.8.1-16 Heat Pump and Heat Recovery Water-Chilling Packages—Minimum Efficiency Requirements.** Add the following footnotes to the title and heading in Table 6.8.1-16 as shown below.
(Note: Additions are shown in underline.)

Table 6.8.1-16 Heat Pump and Heat Recovery Water-Chilling Packages—Minimum Efficiency Requirements

Heat Recovery Heating Full-Load
Efficiency (COP_{HR})^{c,d}, W/W

146 **Table 8.4.4 Minimum Nominal Efficiency Levels for Low-Voltage Dry-Type Distribution Transformers.** Re-letter footnotes in Table 8.4.4 as shown below.
(Note: Additions are shown in underline and deletions are shown in ~~strikethrough~~.)

...

~~c~~b. Kilovolt-ampere rating.

~~d~~e. Nominal efficiencies shall be established in accordance with the 10 CFR 431.193 test procedure for low-voltage dry-type distribution *transformers*.

172 **10.1.1 Scope.** Revise Section 10.1.1 as shown below.
(Note: Additions are shown in underline and deletions are shown in ~~strikethrough~~.)

10. OTHER EQUIPMENT

10.1 General

10.1.1 Scope. This section applies to other *equipment* as described ~~in Section 10.4~~ below.

211 **12.5.2 HVAC Systems.** Revise Section 12.5.2 as shown below.
(Note: Additions are shown in underline and deletions are shown in ~~strikethrough~~.)

12.5.2 HVAC Systems

...

d. Minimum Outdoor Air Ventilation Rate

...

Exceptions to 12.5.2(d):

...

2. Where the minimum outdoor air intake flow in the proposed design is provided in excess of the amount required by Section 6.5.3.8, the ~~baseline building design~~ budget building design shall be modeled to reflect the minimum amount required by Section 6.5.3.8.

...

i. Equipment Capacities.

...

Unmet load hours for the *proposed design* or ~~baseline building design~~ budget building design 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*, provided that sufficient justification is given indicating that the accuracy of the simulation is not significantly compromised by these unmet loads.

...

k. Kitchen Exhaust. For kitchens with a total exhaust hood airflow rate greater than 5000 cfm, use a *demand ventilation system* on 75% of the exhaust air. The *system* shall reduce exhaust and *replacement air system* airflow rates by 50% for one half of the kitchen occupied hours in the ~~baseline building design~~ budget building design. If the *proposed design* uses *demand ventilation*, the same airflow rate schedule shall be used. The maximum exhaust flow rate allowed for the hood or hood section shall meet the requirements of Section 6.5.7.2.2 for the numbers and types of hoods and appliances provided in the *proposed design*.

215

Table 12.5.1 Modeling Requirements for Calculating Design Energy Cost and Energy Cost Budget. Revise Table 12.5.1 as shown below.

(Note: Additions are shown in underline and deletions are shown in ~~strikethrough~~.)

Table 12.5.1 Modeling Requirements for Calculating Design Energy Cost and Energy Cost Budget

Proposed Design (Column A) Design Energy Cost (DEC)

1. Design Model

...

b. All *conditioned spaces* in the *proposed design* shall be simulated as being both heated and cooled, even if no cooling or heating system is being installed. Temperature and humidity control *set points* and schedules, as well as *temperature control throttling range*, shall be the same for proposed design and ~~baseline building design~~ budget building design.

...

4. Schedules

...

Temperature and Humidity Schedules. Temperature and humidity control set points and schedules, as well as *temperature control throttling range*, shall be the same for proposed design and ~~baseline building design~~ budget building design.

...

6. Lighting

- ...d. *Lighting system* power shall include all *lighting system* components shown or provided for on plans (including *lamps*, *ballasts*, *task fixtures*, and *furniture-mounted fixtures*). For *dwelling units*, hotel/motel guest rooms, and other *spaces* in which *lighting systems* consist of plug-in light *fixtures* that are not shown or provided for on *design documents*, assume identical lighting power for the *proposed design* and ~~*baseline building design*~~ *budget building design* in the simulations.

...

Table 12.5.1 Modeling Requirements for Calculating Design Energy Cost and Energy Cost Budget

Budget Building Design (Column B) Energy Cost Budget (ECB)

11. Service Water Heating

...

Exceptions:

...

3. For 24-hour facilities that meet the prescriptive criteria for use of condenser heat recovery systems described in Section 6.5.6.2, a system meeting the requirements of that section shall be included in the ~~*baseline building design*~~ *budget building design*, regardless of the exceptions to Section 6.5.6.2.2. If a condenser heat recovery system meeting the requirements described in Section 6.5.6.2 cannot be modeled, the requirement for including such a system in the actual building shall be met as a prescriptive requirement in accordance with Section 6.5.6.2 and no heat recovery system shall be included in the proposed design or budget building design.

Service water-heating energy consumption shall be calculated explicitly based on the volume of service water heating required, the entering makeup water, and the leaving service water heating temperatures. Entering water temperatures shall be estimated based on the location. Leaving temperatures shall be based on the end-use requirements.

Service water loads and use shall be the same for both the proposed design and ~~*baseline building design*~~ *budget building design* and typical of the proposed building type. Piping losses shall not be modeled.

217 Table 11.5.1 Modeling Requirements for Calculating Design Energy Cost and Energy Cost Budget. Revise item 6.g.1 as shown below.

(Note: Additions are shown in underline and deletions are shown in ~~strikethrough~~.)

6. Lighting

...

g. *Automatic* lighting controls included in the *proposed design* but not required by Section 9.4.1 shall be modeled using the following methods for each luminaire under control:

1. *Manual-ON* or partial-auto-ON *occupancy sensors* shall be modeled by reducing the lighting schedule each hour by the *occupancy sensor* reduction factors in Table G3.7-1 and G3.7-2 for the applicable *space* type multiplied by 1.250.25.

302 G1.3.2 Application Documentation. Revise Section G1.3.2 as shown below.

(Note: Additions are shown in underline and deletions are shown in ~~strikethrough~~.)

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

...

m. Reports from the *simulation program* showing

...3. a description of *energy*-related features of the ~~*budget building design*~~ *baseline building design* and the *proposed design* to support requirements of Section G1.3.2(c).

...

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

307 Table G3.1 Modeling Requirements for Calculating Proposed Building Performance and Baseline Building Performance. Revise Table G3.1 as shown below.

(Note: Additions are shown in underline and deletions are shown in ~~strikethrough~~.)

Table G3.1 Modeling Requirements for Calculating Proposed Building Performance and Baseline Building Performance

Baseline Building Performance

5. Building Envelope

...c. Linear and Point Thermal Bridges. Where *linear thermal bridges* and *point thermal bridges*, as identified in Section 5.5.5 are modeled in the *proposed design*, they shall not be modeled in the ~~*budget building design*~~ *baseline building design*.

310 Table G-1 Modeling Requirements for Calculating Proposed Building Performance and Baseline Building Performance (Continued). Revise Exception to (a) and (b) under 10. HVAC Systems as shown below.

(Note: Additions are shown in underline and deletions are shown in ~~strikethrough~~.)

Exception to (a) and (b): Where part-load performance of chillers in the *proposed design* is not available, and design temperature across the condenser is 10°F, the performance curves in Normative Appendix J ~~Appendix L~~, as referenced in Table J-1, shall be modeled for the specified chiller. When using performance curves from Normative Appendix J ~~Appendix L~~, chiller minimum part-load ratio (ratio of load to available capacity at a given simulation time step) and minimum compressor unloading ratio (part-load ratio below which the chiller capacity cannot be reduced by unloading and chiller is false loaded) shall be equal to 0.25. *Simulation programs* that do not use performance curves are permitted to use an alternative simulation method that results in the same performance as the curves described in Normative Appendix J ~~Appendix L~~.

320 G3.3.2.3 Opaque Assemblies. Revise Section G3.3.2.3 as shown below.

(Note: Additions are shown in underline and deletions are shown in ~~strikethrough~~.)

G3.3.2.3 Opaque Assemblies. *Opaque* assemblies shall be modeled with *U-factors* meeting the requirements in Section ~~5.1.3~~5.1.4.

320 G3.3.2.4 Fenestration. Revise Section G3.3.2.4 as shown below.

(Note: Additions are shown in underline and deletions are shown in ~~strikethrough~~.)

G3.3.2.4 Fenestration. *Fenestration U-factor*, *SHGC*, and *VT* shall be modeled as meeting the requirements in Section ~~5.1.3~~5.1.4.

The *fenestration area* for an *existing building* shall equal the existing *fenestration area* prior to the proposed

work and shall be distributed on each face of the *building* in the same proportions as the *existing building*.

320 G3.3.2.1 General Approach. Revise Section G3.3.2.1 as shown below.
(Note: Additions are shown in underline and deletions are shown in ~~strikethrough~~.)

G3.3.2.1 General Approach. *System* and *equipment* included in the scope of retrofit shall be modeled at ~~efficiency~~ efficiency levels meeting the mandatory and prescriptive requirements in Sections 5 through 10 and as described in this section. All other baseline *systems* and *equipment* shall be modeled the same as in the *proposed design*.

320 G3.3.2.8 HVAC Systems. Revise Section G3.3.2.8 as shown below.
(Note: Additions are shown in underline and deletions are shown in ~~strikethrough~~.)

G3.3.2.8 HVAC Systems

- a. Baseline *HVAC system* types shall be the same as the *proposed design*.
Exception to G3.3.2.8(a): If the *proposed design* includes variable refrigerant flow heat pumps or *single-zone systems* with *electric resistance* heat, then air source heat pumps shall be used in the *baseline design*.
- b. *Baseline systems* shall meet the requirements in Section ~~6.1.36.1.4~~ 6.1.36.1.4. Chillers shall meet the *efficiency* requirements in Table 6.8.1-3 using Path A or Path B, the same as the *proposed design*. If the *proposed design* meets both Path A and Path B requirements, Path A shall be used.
[...]

320 G3.3.2.8 HVAC Systems. Revise Section G3.3.2.8 as shown below.
(Note: Additions are shown in underline and deletions are shown in ~~strikethrough~~.)

G3.3.2.8 HVAC Systems

...e. The *equipment* capacities for the *baseline 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~~ baseline building design.

343 Table G3.9.2 Performance Rating Method Baseline Elevator Motor. Revise Table G3.9.2 as shown below.
(Note: Additions are shown in underline and deletions are shown in ~~strikethrough~~.)

Number of Stories (Including Basement)	Motor Type	Counterweight	Mechanical Efficiency	Motor Efficiency ^a
≤4	Hydraulic	None	58%	Table G3.9.3
>4	Traction	<i>Proposed design</i> counterweight, if not specified use weight of the car plus 40% of the rated load	64%	<u>Table G3.9.1</u> <u>G3.9.3</u>

375 L2.1.5 Calculating TSPR. Revise Equation L-1 as shown below.

L2.1.5 Calculating TSPR. $TSPR_p$ shall be calculated according to Equation L-1:

$$TSPR_p = \frac{Loads_p}{HVACinput_p} \tag{L-1}$$

386 **L5. TSPR METRIC FOR SITE HVAC ENERGY INPUT.** Revise Informative Note 2 in Section L5 as shown below.

Informative Notes:

...

- For ~~source~~ site energy, replace Table 6.6.2.2 MPF values with those in Informative Table L5-4.
- For site-source energy, replace Table 6.6.2.2 MPF values with those in Informative Table L5-5.

387 **Table L4.3.2-1 TSPR Reference Building Design HVAC Complex Systems.** Update Table L4.3.2-1 as shown in the attached. Change highlighted in yellow.

393 **Table M-1 Addenda to ANSI/ASHRAE/IES Standard 90.1-2019.** Add the addenda to Table M-1 as shown in the attached.

394 **Table M-1 Addenda to ANSI/ASHRAE/IES Standard 90.1-2019.** Update the Description of Changes for Addendum t as shown in the attached. Change highlighted in yellow.

395 **Table M-1 Addenda to ANSI/ASHRAE/IES Standard 90.1-2019.** Revise Table M-1 as shown in the attached, for Addenda ac and ar.
(Note: Additions are shown in underline and deletions are shown in ~~strikethrough~~.)

400-414 **Table Annex1-1 ASHRAE Standard 169-2013, Table B-1: U.S. Climate Zones by State and County.** Replace Table Annex1-1 with the attached.

Table L4.3.2-1 TSPR Reference Building Design HVAC Complex Systems

Building Type Parameter	Large Office (warm) ^a	Large Office (cold) ^b	School (warm) ^a	School (cold) ^b
System type	VAV/reheat water-cooled chiller/ electric reheat with parallel fan powered boxes	VAV/reheat water-cooled chiller/ gas boiler	VAV/reheat water-cooled chiller/ electric reheat with parallel fan powered boxes	VAV/reheat water-cooled chiller/ gas boiler
Fan control	VSD, no static pressure reset	VSD, no static pressure reset	VSD, no static pressure reset	VSD, no static pressure reset
Main fan power (W/cfm) proposed ≥MERV13	1.165	1.165	1.165	1.165
Main fan power (W/cfm) proposed <MERV13	1.066	1.066	1.066	1.066
Zonal fan power, W/cfm	0.35	NA	0.35	NA
Minimum zone airflow fraction	$1.5 \times V_{oz}$	$1.5 \times V_{oz}$	$1.2 \times V_{oz}$	$1.2 \times V_{oz}$
Heat/cool sizing factor	1.25/1.15	1.25/1.15	1.25/1.15	1.25/1.15
Outdoor air economizer	No	Yes except 4A	No	Yes except 4A
Occupied outdoor air (= proposed)	$\text{Sum}(V_{oz})/0.75$	$\text{Sum}(V_{oz})/0.75$	$\text{Sum}(V_{oz})/0.65$	$\text{Sum}(V_{oz})/0.65$
Energy recovery ventilator enthalpy recovery ratio bypass; SAT set point	NA	NA	50%; no bypass	50%; 60°F except no bypass required in Climate Zone 4A
Demand control ventilation	No	No	No	No
Cooling source	2 water-cooled centrif. chillers	2 water-cooled centrif. chillers	2 water-cooled screw chillers	2 water-cooled screw chillers
Cooling efficiency	Table G3.5.3	Table G3.5.3	Table G3.5.3	Table G3.5.3
Heating source (reheat)	Electric resistance	Gas boiler	Electric resistance	Gas boiler
Furnace or boiler efficiency	1.0	$75\% E_t$	1.0	$80\% E_t$
Condenser heat rejection	Axial-fan open-circuit cooling tower			
Cooling-tower efficiency, gpm/hp (See Section G3.2.3.11)	38.2	38.2	38.2	38.2
Open-circuit cooling-tower turndown (>300 ton)	50%	50%	50%	50%
Pump (constant flow/variable flow)/range	Constant flow; 10°F range	Constant flow; 10°F range	Constant flow; 10°F range	Constant flow; 10°F range

Open-circuit cooling-tower approach	<u>G3.1.3.11G3.2.3.11</u>	<u>G3.1.3.11G3.2.3.11</u>	<u>G3.1.3.11G3.2.3.11</u>	<u>G3.1.3.11G3.2.3.11</u>
Cooling condenser <i>pump</i> power, W/gpm	19	19	19	19

Table M-1 Addenda to ANSI/ASHRAE/IES Standard 90.1-2019						
Addendum	Sections	Description of Changes^a	ASHRAE Standard Committee Approval	Co-sponsor Approval (IES)	ASHRAE BOD/Tech Council Approval	ANSI Approval
ba	9.4.1, Table 9.5.2.1, Appendix E, Table G3.7-1, Table G3.7-2	Updates the space-by-space LPD values based on efficacy improvements consistent with manufacturer data sheets. Makes various changes to lighting control requirements, including the addition of several new space types and a new requirement for multilevel control with continuous dimming in place of bilevel lighting control.	7/20/2022	9/8/2022	8/15/2022	9/9/2022
cc	10.5.1.1	Increases the prescriptive on-site renewable energy requirement added by Addendum by from 0.25 W/ft ² to 0.5 W/ft ² .	7/20/2022	9/8/2022	8/15/2022	9/9/2022

Table M-1 Addenda to ANSI/ASHRAE/IES Standard 90.1-2019

Addendum	Sections	Description of Changes^a	ASHRAE Standard Committee Approval	Cosponsor Approval (IES)	ASHRAE BOD/Tech Council Approval	ANSI Approval
t	3.2, 4.2.5, 5.1.3, 5.4.3, 5.7.2, 5.7.3.1, 5.8, 5.9.1.2, 6.4.4.2.1, 6.4.5, 6.5.1, Table 12.5.1 (5), 12.5.3, 13, C1.5, C3.5.5.3, C3.6, C3.1.1.4, Table G3.1 (5), Table H-3	Adds requirement to perform whole-building air leakage testing and measurement on buildings less than 25,000 10,000 ft ² , specifies performance requirements for compliance, references the applicable ASTM standard, and modifies relevant Section 3 terminology.	6/25/2022	6/17/2022	6/29/2022	7/29/2022

Table M-1 Addenda to ANSI/ASHRAE/IES Standard 90.1-2019

Addendum	Sections	Description of Changes^a	ASHRAE Standard Committee Approval	Co-sponsor Approval (IES)	ASHRAE BOD/Tech Council Approval	ANSI Approval
ac	3.2, 9.4.1.2, Table 9.2.3-19.2.2.1 , Table 9.6.1, Appendix E	Updates interior lighting power and minimum control requirements: adds a power exception for the germicidal function in luminaires and sources, removes exceptions for casinos and parking garage daylight transition zone lighting, and provides a definition for the latter item.	6/25/2022	6/17/2022	6/29/2022	7/29/2022
ar	3.2, Table 9.2.3-19.2.2.1 , 9.4.4, Appendix E	Adds requirements for indoor horticultural lighting based on a new metric, photosynthetic photon efficacy (PPE), developed in ANSI/ASABE S640.	7/20/2022	9/8/2022	8/15/2022	9/9/2022

Table Annex1-1 ASHRAE Standard 169-2013, Table B-1: U.S. Climate Zones by State and County

State/County	Zone	State/County	Zone
Alabama (AL)		Arkansas (AR)	
	<i>Zone 3A except...</i>		<i>Zone 3A except...</i>
Baldwin	2A	Baxter	4A
Coffee	2A	Benton	4A
Covington	2A	Boone	4A
Dale	2A	Carroll	4A
Escambia	2A	Fulton	4A
Geneva	2A	Izard	4A
Henry	2A	Madison	4A
Houston	2A	Marion	4A
Mobile	2A	Newton	4A
Alaska (AK)		Searcy	4A
	<i>Zone 7 except...</i>	Stone	4A
Ketchikan Gateway	5C	Washington	4A
Prince of Wales-Outer Ketchikan	5C	California (CA)	
Sitka	5C		<i>Zone 3B except...</i>
Haines	6A	Imperial	2B
Juneau	6A	Alameda	3C
Kodiak Island	6A	Marin	3C
Skagway-Hoonah-Angoon	6A	Mendocino	3C
Wrangell-Petersburg	6A	Monterey	3C
Denali	8	Napa	3C
Fairbanks North Star	8	San Benito	3C
Nome	8	San Francisco	3C
North Slope	8	San Luis Obispo	3C
Northwest Arctic	8	San Mateo	3C
Southeast Fairbanks	8	Santa Barbara	3C
Wade Hampton	8	Santa Clara	3C
Yukon-Koyukuk	8	Santa Cruz	3C
Arizona (AZ)		Sonoma	3C
	<i>Zone 3B except...</i>	Ventura	3C
La Paz	2B	Amador	4B
Maricopa	2B	Calaveras	4B
Pima	2B	El Dorado	4B
Pinal	2B	Inyo	4B
Yuma	2B	Lake	4B
Gila	4B	Mariposa	4B
Yavapai	4B	Trinity	4B
Apache	5B	Tuolumne	4B
Coconino	5B	Del Norte	4C
Navajo	5B	Humboldt	4C

Table Annex1-1 ASHRAE Standard 169-2013, Table B-1: U.S. Climate Zones by State and County (Continued)

State/County	Zone	State/County	Zone
Lassen	5B	Connecticut (CT)	
Modoc	5B	Zone 5A	
Nevada	5B	Delaware (DE)	
Plumas	5B	Zone 4A	
Sierra	5B	District of Columbia (DC)	
Siskiyou	5B	Zone 4A	
Alpine	6B	Florida (FL)	
Mono	6B	Zone 2A except...	
Colorado (CO)		Broward	1A
Zone 5B except...		Miami-Dade	1A
Baca	4B	Monroe	1A
Bent	4B	Palm Beach	1A
Las Animas	4B	Georgia (GA)	
Otero	4B	Zone 3A except...	
Prowers	4B	Appling	2A
Alamosa	6B	Atkinson	2A
Archuleta	6B	Bacon	2A
Chaffee	6B	Baker	2A
Conejos	6B	Berrien	2A
Costilla	6B	Brantley	2A
Dolores	6B	Brooks	2A
Eagle	6B	Bryan	2A
Moffat	6B	Calhoun	2A
Ouray	6B	Camden	2A
Rio Blanco	6B	Charlton	2A
Saguache	6B	Chatham	2A
San Miguel	6B	Clinch	2A
Clear Creek	7	Coffee	2A
Grand	7	Colquitt	2A
Gunnison	7	Cook	2A
Hinsdale	7	Decatur	2A
Jackson	7	Dougherty	2A
Lake	7	Early	2A
Mineral	7	Echols	2A
Park	7	Effingham	2A
Pitkin	7	Evans	2A
Rio Grande	7	Glynn	2A
Routt	7	Grady	2A
San Juan	7	Irwin	2A
Summit	7	Jeff Davis	2A

Table Annex1-1 ASHRAE Standard 169-2013, Table B-1: U.S. Climate Zones by State and County (Continued)

State/County	Zone	State/County	Zone
Lanier	2A	Illinois (IL)	
Liberty	2A		<i>Zone 5A except...</i>
Long	2A	Alexander	4A
Lowndes	2A	Bond	4A
McIntosh	2A	Calhoun	4A
Miller	2A	Christian	4A
Mitchell	2A	Clark	4A
Pierce	2A	Clay	4A
Seminole	2A	Clinton	4A
Tattnall	2A	Coles	4A
Thomas	2A	Crawford	4A
Tift	2A	Cumberland	4A
Toombs	2A	Edwards	4A
Ware	2A	Effingham	4A
Wayne	2A	Fayette	4A
Worth	2A	Franklin	4A
Hawaii (HI)		Gallatin	4A
Zone 1A		Greene	4A
Idaho (ID)		Hamilton	4A
	<i>Zone 6B except...</i>	Hardin	4A
Ada	5B	Jackson	4A
Benewah	5B	Jasper	4A
Canyon	5B	Jefferson	4A
Cassia	5B	Jersey	4A
Clearwater	5B	Johnson	4A
Elmore	5B	Lawrence	4A
Gem	5B	Macoupin	4A
Gooding	5B	Madison	4A
Idaho	5B	Marion	4A
Jerome	5B	Massac	4A
Kootenai	5B	Monroe	4A
Latah	5B	Montgomery	4A
Lewis	5B	Perry	4A
Lincoln	5B	Pope	4A
Minidoka	5B	Pulaski	4A
Nez Perce	5B	Randolph	4A
Owyhee	5B	Richland	4A
Payette	5B	Saline	4A
Power	5B	Shelby	4A
Shoshone	5B	St. Clair	4A
Twin Falls	5B	Union	4A
Washington	5B	Wabash	4A

Table Annex1-1 ASHRAE Standard 169-2013, Table B-1: U.S. Climate Zones by State and County (Continued)

State/County	Zone	State/County	Zone
Washington	4A	Scott	4A
Wayne	4A	Shelby	4A
White	4A	Spencer	4A
Williamson	4A	Sullivan	4A
Indiana (IN)		Switzerland	4A
	<i>Zone 5A except...</i>	Union	4A
Bartholomew	4A	Vanderburgh	4A
Brown	4A	Vigo	4A
Clark	4A	Warrick	4A
Clay	4A	Washington	4A
Crawford	4A	Iowa (IA)	
Daviess	4A		<i>Zone 5A except...</i>
Dearborn	4A	Cerro Gordo	6A
Decatur	4A	Clay	6A
Dubois	4A	Dickinson	6A
Fayette	4A	Emmet	6A
Floyd	4A	Hancock	6A
Franklin	4A	Kossuth	6A
Gibson	4A	Lyon	6A
Greene	4A	Mitchell	6A
Harrison	4A	O'Brien	6A
Hendricks	4A	Osceola	6A
Jackson	4A	Palo Alto	6A
Jefferson	4A	Sioux	6A
Jennings	4A	Winnebago	6A
Johnson	4A	Worth	6A
Knox	4A	Kansas (KS)	
Lawrence	4A		<i>Zone 4A except...</i>
Marion	4A	Cheyenne	5A
Martin	4A	Decatur	5A
Monroe	4A	Gove	5A
Morgan	4A	Greeley	5A
Ohio	4A	Jewell	5A
Orange	4A	Logan	5A
Owen	4A	Norton	5A
Perry	4A	Phillips	5A
Pike	4A	Rawlins	5A
Posey	4A	Republic	5A
Putnam	4A	Scott	5A
Ripley	4A	Sheridan	5A
Rush	4A	Sherman	5A

Table Annex1-1 ASHRAE Standard 169-2013, Table B-1: U.S. Climate Zones by State and County (Continued)

State/County	Zone	State/County	Zone
Smith	5A	Massachusetts (MA)	
Thomas	5A	Zone 5A	
Wallace	5A	Michigan (MI)	
Wichita	5A		<i>Zone 5A except...</i>
Kentucky (KY)		Alcona	6A
Zone 4A		Alger	6A
Louisiana (LA)		Alpena	6A
	<i>Zone 2A except...</i>	Antrim	6A
Bienville Parish	3A	Arenac	6A
Bossier Parish	3A	Baraga	6A
Caddo Parish	3A	Benzie	6A
Caldwell Parish	3A	Charlevoix	6A
Catahoula Parish	3A	Cheboygan	6A
Claiborne Parish	3A	Chippewa	6A
Concordia Parish	3A	Clare	6A
De Soto Parish	3A	Crawford	6A
East Carroll Parish	3A	Delta	6A
Franklin Parish	3A	Dickinson	6A
Grant Parish	3A	Emmet	6A
Jackson Parish	3A	Gladwin	6A
La Salle Parish	3A	Gogebic	6A
Lincoln Parish	3A	Grand Traverse	6A
Madison Parish	3A	Houghton	6A
Morehouse Parish	3A	Iosco	6A
Natchitoches Parish	3A	Iron	6A
Ouachita Parish	3A	Isabella	6A
Red River Parish	3A	Kalkaska	6A
Richland Parish	3A	Lake	6A
Sabine Parish	3A	Leelanau	6A
Tensas Parish	3A	Luce	6A
Union Parish	3A	Mackinac	6A
Vernon Parish	3A	Manistee	6A
Webster Parish	3A	Mason	6A
West Carroll Parish	3A	Mecosta	6A
Winn Parish	3A	Menominee	6A
Maine (ME)		Missaukee	6A
	<i>Zone 6A except...</i>	Montmorency	6A
Aroostook	7	Newaygo	6A
Maryland (MD)		Oceana	6A
	<i>Zone 4A except...</i>	Ogemaw	6A
Allegany	5A	Ontonagon	6A
Garrett	5A	Osceola	6A

Table Annex1-1 ASHRAE Standard 169-2013, Table B-1: U.S. Climate Zones by State and County (Continued)

State/County	Zone	State/County	Zone
Oscoda	6A	Jackson	2A
Otsego	6A	Pearl River	2A
Presque Isle	6A	Stone	2A
Roscommon	6A	Missouri (MO)	
Schoolcraft	6A	<i>Zone 4A except...</i>	
Wexford	6A	Dunklin	3A
Keweenaw	7	Pemiscot	3A
Marquette	7	Adair	5A
Minnesota (MN)		Andrew	5A
<i>Zone 6A except...</i>		Atchison	5A
Fillmore	5A	Clark	5A
Houston	5A	Daviess	5A
Winona	5A	DeKalb	5A
Aitkin	7	Gentry	5A
Beltrami	7	Grundy	5A
Carlton	7	Harrison	5A
Cass	7	Holt	5A
Clearwater	7	Knox	5A
Cook	7	Lewis	5A
Crow Wing	7	Linn	5A
Hubbard	7	Livingston	5A
Itasca	7	Macon	5A
Kittson	7	Marion	5A
Koochiching	7	Mercer	5A
Lake	7	Nodaway	5A
Lake of the Woods	7	Pike	5A
Mahnomen	7	Putnam	5A
Marshall	7	Ralls	5A
Norman	7	Schuyler	5A
Pennington	7	Scotland	5A
Pine	7	Shelby	5A
Polk	7	Sullivan	5A
Red Lake	7	Worth	5A
Roseau	7	Montana (MT)	
St. Louis	7	Zone 6B	
Wadena	7	Nebraska (NE)	
Mississippi (MS)		Zone 5A	
<i>Zone 3A except...</i>		Nevada (NV)	
George	2A	<i>Zone 5B except...</i>	
Hancock	2A	Clark	3B
Harrison	2A	Carson City	4B

Table Annex1-1 ASHRAE Standard 169-2013, Table B-1: U.S. Climate Zones by State and County (Continued)

State/County	Zone	State/County	Zone
Douglas	4B	Union	4B
Esmeralda	4B	Valencia	4B
Lincoln	4B	New York (NY)	
Lyon	4B	<i>Zone 5A except...</i>	
Mineral	4B	Bronx	4A
Nye	4B	Kings	4A
New Hampshire (NH)		Nassau	4A
<i>Zone 6A except...</i>		New York	4A
Hillsborough	5A	Queens	4A
Merrimack	5A	Richmond	4A
Rockingham	5A	Suffolk	4A
Strafford	5A	Chenango	6A
New Jersey (NJ)		Clinton	6A
<i>Zone 4A except...</i>		Delaware	6A
Bergen	5A	Essex	6A
Hunterdon	5A	Franklin	6A
Morris	5A	Fulton	6A
Passaic	5A	Hamilton	6A
Somerset	5A	Herkimer	6A
Sussex	5A	Jefferson	6A
Warren	5A	Lewis	6A
New Mexico (NM)		Madison	6A
<i>Zone 5B except...</i>		Montgomery	6A
Chaves	3B	Oneida	6A
Dona Ana	3B	Otsego	6A
Eddy	3B	St. Lawrence	6A
Hidalgo	3B	Sullivan	6A
Lea	3B	Ulster	6A
Luna	3B	Warren	6A
Otero	3B	North Carolina (NC)	
Sierra	3B	<i>Zone 3A except...</i>	
Bernalillo	4B	Alleghany	5A
Catron	4B	Ashe	5A
Curry	4B	Avery	5A
DeBaca	4B	Buncombe	4A
Grant	4B	Burke	4A
Guadalupe	4B	Caldwell	4A
Lincoln	4B	Graham	4A
Quay	4B	Haywood	4A
Roosevelt	4B	Henderson	4A
Socorro	4B	Jackson	4A

Table Annex1-1 ASHRAE Standard 169-2013, Table B-1: U.S. Climate Zones by State and County (Continued)

State/County	Zone	State/County	Zone
Macon	4A	Greene	4A
Madison	4A	Hamilton	4A
McDowell	4A	Highland	4A
Mitchell	4A	Hocking	4A
Stokes	4A	Jackson	4A
Surry	4A	Lawrence	4A
Swain	4A	Madison	4A
Transylvania	4A	Meigs	4A
Watauga	5A	Pickaway	4A
Wilkes	5A	Pike	4A
Yadkin	4A	Ross	4A
Yancy	5A	Scioto	4A
North Dakota (ND)		Vinton	4A
	<i>Zone 6A except...</i>	Warren	4A
Benson	7	Washington	4A
Bottineau	7	Oklahoma (OK)	
Burke	7		<i>Zone 3A except...</i>
Cavalier	7	Alfalfa	4A
Divide	7	Craig	4A
Grand Forks	7	Delaware	4A
McHenry	7	Ellis	4A
Nelson	7	Garfield	4A
Pembina	7	Grant	4A
Pierce	7	Harper	4A
Ramsey	7	Kay	4A
Renville	7	Major	4A
Rolette	7	Nowata	4A
Towner	7	Osage	4A
Walsh	7	Ottawa	4A
Ward	7	Washington	4A
Ohio (OH)		Woods	4A
	<i>Zone 5A except...</i>	Woodward	4A
Adams	4A	Beaver	4B
Athens	4A	Cimarron	4B
Brown	4A	Texas	4B
Butler	4A	Oregon (OR)	
Clermont	4A		<i>Zone 4C except...</i>
Clinton	4A	Baker	5B
Fayette	4A	Crook	5B
Franklin	4A	Deschutes	5B
Gallia	4A	Gilliam	5B

Table Annex1-1 ASHRAE Standard 169-2013, Table B-1: U.S. Climate Zones by State and County (Continued)

State/County	Zone	State/County	Zone
Grant	5B	Charles Mix	5A
Harney	5B	Clay	5A
Hood River	5B	Douglas	5A
Jefferson	5B	Gregory	5A
Klamath	5B	Haakon	5A
Lake	5B	Hutchinson	5A
Malheur	5B	Jackson	5A
Morrow	5B	Jones	5A
Sherman	5B	Lyman	5A
Umatilla	5B	Mellette	5A
Union	5B	Stanley	5A
Wallowa	5B	Todd	5A
Wasco	5B	Tripp	5A
Wheeler	5B	Union	5A
Pennsylvania (PA)		Yankton	5A
<i>Zone 5A except...</i>		Tennessee (TN)	
<i>Zone 5A except...</i>		<i>Zone 4A except...</i>	
Adams	4A	Bedford	3A
Berks	4A	Chester	3A
Bucks	4A	Coffee	3A
Chester	4A	Crockett	3A
Cumberland	4A	Davidson	3A
Dauphin	4A	Decatur	3A
Delaware	4A	Dyer	3A
Franklin	4A	Fayette	3A
Lancaster	4A	Franklin	3A
Lebanon	4A	Gibson	3A
Montgomery	4A	Giles	3A
Perry	4A	Grundy	3A
Philadelphia	4A	Hamilton	3A
York	4A	Hardeman	3A
Rhode Island (RH)		Hardin	3A
Zone 5A		Haywood	3A
South Carolina (SC)		Henderson	3A
<i>Zone 3A except...</i>		Hickman	3A
Beaufort	2A	Lauderdale	3A
Jasper	2A	Lawrence	3A
South Dakota (SD)		Lewis	3A
<i>Zone 6A except...</i>		Lincoln	3A
Bennett	5A	Madison	3A
Bon Homme	5A	Marion	3A
Brule	5A		

Table Annex1-1 ASHRAE Standard 169-2013, Table B-1: U.S. Climate Zones by State and County (Continued)

State/County	Zone	State/County	Zone
Marshall	3A	Fayette	2A
Maury	3A	Fort Bend	2A
McNairy	3A	Freestone	2A
Moore	3A	Galveston	2A
Perry	3A	Goliad	2A
Rutherford	3A	Gonzales	2A
Shelby	3A	Grimes	2A
Tipton	3A	Guadalupe	2A
Wayne	3A	Hardin	2A
Williamson	3A	Harris	2A
Texas (TX)		Hays	2A
	<i>Zone 3A except...</i>	Hill	2A
Cameron	1A	Houston	2A
Hidalgo	1A	Jackson	2A
Willacy	1A	Jasper	2A
Anderson	2A	Jefferson	2A
Angelina	2A	Jim Hogg	2A
Aransas	2A	Jim Wells	2A
Atascosa	2A	Johnson	2A
Austin	2A	Karnes	2A
Bastrop	2A	Kenedy	2A
Bee	2A	Kleberg	2A
Bell	2A	Lavaca	2A
Bexar	2A	Lee	2A
Bosque	2A	Leon	2A
Brazoria	2A	Liberty	2A
Brazos	2A	Limestone	2A
Brooks	2A	Live Oak	2A
Burleson	2A	Madison	2A
Caldwell	2A	Matagorda	2A
Calhoun	2A	McLennan	2A
Chambers	2A	McMullen	2A
Cherokee	2A	Milam	2A
Colorado	2A	Montgomery	2A
Comal	2A	Navarro	2A
Coryell	2A	Newton	2A
Dallas	2A	Nueces	2A
DeWitt	2A	Orange	2A
Duval	2A	Polk	2A
Ellis	2A	Refugio	2A
Falls	2A	Robertson	2A

Table Annex1-1 ASHRAE Standard 169-2013, Table B-1: U.S. Climate Zones by State and County (Continued)

State/County	Zone	State/County	Zone
San Jacinto	2A	Crosby	3B
San Patricio	2A	Culberson	3B
Starr	2A	Dawson	3B
Tarrant	2A	Dickens	3B
Travis	2A	Ector	3B
Trinity	2A	El Paso	3B
Tyler	2A	Fisher	3B
Victoria	2A	Foard	3B
Walker	2A	Gaines	3B
Waller	2A	Garza	3B
Washington	2A	Glasscock	3B
Wharton	2A	Hall	3B
Williamson	2A	Hardeman	3B
Wilson	2A	Haskell	3B
Bandera	2B	Hemphill	3B
Dimmit	2B	Howard	3B
Edwards	2B	Hudspeth	3B
Frio	2B	Irion	3B
Kinney	2B	Jeff Davis	3B
La Salle	2B	Jones	3B
Maverick	2B	Kent	3B
Medina	2B	Kerr	3B
Real	2B	Kimble	3B
Uvalde	2B	King	3B
Val Verde	2B	Knox	3B
Webb	2B	Loving	3B
Zapata	2B	Lubbock	3B
Zavala	2B	Lynn	3B
Andrews	3B	Martin	3B
Baylor	3B	Mason	3B
Borden	3B	McCulloch	3B
Brewster	3B	Menard	3B
Callahan	3B	Midland	3B
Childress	3B	Mitchell	3B
Coke	3B	Motley	3B
Coleman	3B	Nolan	3B
Collingsworth	3B	Pecos	3B
Concho	3B	Presidio	3B
Cottle	3B	Reagan	3B
Crane	3B	Reeves	3B
Crockett	3B	Runnels	3B

Table Annex1-1 ASHRAE Standard 169-2013, Table B-1: U.S. Climate Zones by State and County (Continued)

State/County	Zone	State/County	Zone
Schleicher	3B	Sherman	4B
Scurry	3B	Swisher	4B
Shackelford	3B	Yoakum	4B
Sterling	3B	Utah (UT)	
Stonewall	3B	<i>Zone 5B except...</i>	
Sutton	3B	Washington	3B
Taylor	3B	Daggett	6B
Terrell	3B	Duchesne	6B
Terry	3B	Morgan	6B
Throckmorton	3B	Rich	6B
Tom Green	3B	Summit	6B
Upton	3B	Uintah	6B
Ward	3B	Wasatch	6B
Wheeler	3B	Vermont (VT)	
Wilbarger	3B	Zone 6A	
Winkler	3B	Virginia (VA)	
Armstrong	4B	<i>Zone 4A except...</i>	
Bailey	4B	Alleghany	5A
Briscoe	4B	Bath	5A
Carson	4B	Brunswick	3A
Castro	4B	Chesapeake city	3A
Cochran	4B	Clifton Forge city	5A
Dallam	4B	Covington city	5A
Deaf Smith	4B	Emporia city	3A
Donley	4B	Franklin city	3A
Floyd	4B	Greensville	3A
Gray	4B	Halifax	3A
Hale	4B	Hampton city	3A
Hansford	4B	Highland	5A
Hartley	4B	Isle of Wight	3A
Hockley	4B	Mecklenburg	3A
Hutchinson	4B	Newport News city	3A
Lamb	4B	Norfolk city	3A
Lipscomb	4B	Pittsylvania	3A
Moore	4B	Portsmouth city	3A
Ochiltree	4B	South Boston	3A
Oldham	4B	Southampton	3A
Parmer	4B	Suffolk city	3A
Potter	4B	Surry	3A
Randall	4B	Sussex	3A
Roberts	4B	Virginia Beach city	3A

Table Annex1-1 ASHRAE Standard 169-2013, Table B-1: U.S. Climate Zones by State and County (Continued)

State/County	Zone	State/County	Zone
Washington (WA)		Mason	4A
	<i>Zone 5B except...</i>	McDowell	4A
Clark	4C	Mercer	4A
Cowlitz	4C	Mingo	4A
Grays Harbor	4C	Monroe	4A
Jefferson	4C	Morgan	4A
King	4C	Nicholas	4A
Lewis	4C	Pleasants	4A
Mason	4C	Putnam	4A
Pacific	4C	Raleigh	4A
Pierce	4C	Ritchie	4A
Skagit	4C	Roane	4A
Snohomish	4C	Summers	4A
Thurston	4C	Tyler	4A
Wahkiakum	4C	Upshur	4A
Whatcom	4C	Wayne	4A
Clallam	5C	Webster	4A
Island	5C	Wirt	4A
Kitsap	5C	Wood	4A
San Juan	5C	Wyoming	4A
Ferry	6B	Wisconsin (WI)	
Pend Oreille	6B		<i>Zone 6A except...</i>
Stevens	6B	Adams	5A
West Virginia (WV)		Calumet	5A
	<i>Zone 5A except...</i>	Columbia	5A
Berkeley	4A	Crawford	5A
Boone	4A	Dane	5A
Braxton	4A	Dodge	5A
Cabell	4A	Fond du Lac	5A
Calhoun	4A	Grant	5A
Clay	4A	Green	5A
Doddridge	4A	Green Lake	5A
Fayette	4A	Iowa	5A
Gilmer	4A	Jefferson	5A
Greenbrier	4A	Juneau	5A
Jackson	4A	Kenosha	5A
Jefferson	4A	La Crosse	5A
Kanawha	4A	Lafayette	5A
Lewis	4A	Milwaukee	5A
Lincoln	4A	Monroe	5A
Logan	4A	Outagamie	5A

Table Annex1-1 ASHRAE Standard 169-2013, Table B-1: U.S. Climate Zones by State and County (Continued)

State/County	Zone	State/County	Zone
Ozaukee	5A	Platte	5B
Racine	5A	Lincoln	7
Richland	5A	Sublette	7
Rock	5A	Teton	7
Sauk	5A	Commonwealth/Municipality	Zone
Vernon	5A	Puerto Rico (PR)	
Walworth	5A	<i>Zone 1A except...</i>	
Washington	5A	Barraquitas	2B
Waukesha	5A	Cayey	2B
Waushara	5A	Other	Zone
Winnebago	5A	Pacific Islands (PI)	
Wyoming (WY)		<i>Zone 1A except...</i>	
	<i>Zone 6B except...</i>	Midway Sand Island	2A
Goshen	5B	Virgin Islands (VI)	
Laramie	5B	Zone 1A	