ADDENDA

ANSI/ASHRAE/IES Addendum ea to
ANSI/ASHRAE/IES Standard 90.1-2013

Energy Standard for Buildings Except Low-Rise Residential Buildings

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FOREWORD

Addendum ea to Standard 90.1 generally addresses minor inconsistencies in terminology in Sections 5 through 11 that have developed over time. Terminology is coordinated with the definitions in Section 3.

[Note: 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.]

Addendum ea to 90.1-2013

Revise Section 3 as follows (I-P and SI):

…

building: ~~a structure wholly or partially enclosed within exterior walls or within exterior and party walls, and a roof, affording shelter to persons, animals, or property~~ any structure used or intended for supporting or sheltering any use or occupancy.

…

exterior wall: see *building envelope* and *wall*.

…

floor area, gross: the sum of the floor areas of the spaces within the building, including basements, mezzanine and intermediate-floored tiers, and penthouses with a headroom height of 7.5 ft (2.3 m) or greater. It is measured from the exterior faces of ~~exterior~~ walls or from the centerline of walls separating buildings, but excluding covered walkways, open roofed-over areas, porches and similar spaces, pipe trenches, exterior terraces or steps, chimneys, roof overhangs, and similar features.

…

grade: the finished ground level adjoining a building at all ~~exterior~~ walls.

…

nonweatherized space constrained single-package vertical unit: a single-package vertical air conditioner (SPVAC) or single-package vertical heat pump (SPVHP) that meets all of the following requirements:

a. Is for indoor use only
b. Has rated cooling capacities no greater than 36,000 Btu/h (11 kW)
c. Is a single-package unit requiring opening in an exterior wall or *semi-exterior wall* with overall exterior dimensions that requires or uses an existing sleeve that meets one of the following criteria:
    1. Has a width of less than 32 in. (813 mm) and height of less than 45 in. (1143 mm)
    2. Fits inside an existing 1310 in.^{2} (845,160 mm^2) opening
d. Is commonly installed in site-built commercial buildings
e. Is of a similar cooling capacity and, if a heat pump, similar heating capacity
f. Draws outdoor air for heat exchange directly through an existing opening, used for both inlet and outlet, in the exterior wall or *semi-exterior wall*
g. Is restricted to applications where an existing air conditioner, heat pump, or gas/electric unit, installed in an existing exterior wall or *semi-exterior wall* opening, is to be replaced
h. …

…

semi-exterior wall: see *building envelope* and *wall*.

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Revise Section 5.1.2 as follows (I-P and SI):

5.1.2 Space-Conditioning Categories

5.1.2.1 Separate ~~exterior~~ building envelope requirements are specified for: (a) nonresidential conditioned space, (b) residential conditioned space, and (c) semiheated space.

…

5.1.2.3 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.

~~5.1.2.4~~ **Exception:** In Climate Zones 3 through 8, a space may be designated as either a semiheated space or an unconditioned space only if approved by the building official.

Revise Section 5.4.3.1 as follows (I-P and SI):

5.4.3.1 Continuous Air Barrier. ….

5.4.3.1.1 Air Barrier Design. The air barrier shall be designed and noted in the following manner:

a. All air barrier components of each building envelope assembly shall be clearly identified or otherwise noted on construction documents.

b. The joints, interconnections, and penetrations of the air barrier components, including lighting fixtures, shall be detailed or otherwise noted.

c. The continuous air barrier shall extend over all surfaces of the building envelope (at the lowest floor, ~~exterior~~ walls, and ~~ceiling or~~ roof)

d. …

Revise Section 6.4.3.1 as follows (I-P and SI):

6.4.3.1 Zone Thermostatic Controls

6.4.3.1.1 General. The supply of heating and cooling energy to each zone shall be individually controlled by thermostatic controls responding to temperature within the zone. For the purposes of this section, a dwelling unit shall be permitted to be considered a single zone.

Exceptions: Independent perimeter systems that are designed to offset only building envelope loads shall be permitted to serve one or more zones also served by an interior system, provided that

1. the perimeter system includes at least one thermostatic control zone for each building exposure having ~~exterior~~ walls facing only one orientation for 50 contiguous feet (15 contiguous meters) or more and

2. the perimeter system heating and cooling supply is controlled by a thermostatic control(s) located within the zones(s) served by the system.

Exterior walls and *semi-exterior walls* are considered to have different orientations if the ~~directions~~ exposures they face differ by more than 45 degrees.

Revise Table 6.8.2-1 as follows (I-P and SI):

Table 6.8.2-1 Minimum Duct Insulation R-Value,[a] Cooling- and Heating-Only Supply Ducts and Return Ducts

…

[a] Insulation R-values, measured in (h·ft^2·°F)/Btu (, are for the insulation as installed and do not include film resistance. The required minimum thicknesses do not consider water vapor transmission and possible surface condensation. Where ~~exterior walls~~ portions of the *building envelope* are used as a plenum enclosure ~~walls~~, ~~wall~~ *building envelope* insulation shall be as required by the most restrictive condition of Section 6.4.4.2 or Section 5,

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depending on whether the plenum is located in the roof, wall, or floor. Insulation resistance measured on a horizontal plane in accordance with ASTM C518 at a mean temperature of 75°F (23.9°C) at the installed thickness

Revise Table 6.8.2-2 as follows (I-P and SI):

Table 6.8.2-2 Minimum Duct Insulation R-Value,[a] Combined Heating and Cooling Supply Ducts and Return Ducts

…

[a] Insulation R-values, measured in (h·ft^2·°F)/Btu ((, are for the insulation as installed and do not include film resistance. The required minimum thicknesses do not consider water vapor transmission and possible surface condensation. Where ~~exterior walls~~ portions of the *building envelope* are used as a plenum enclosure ~~walls~~, ~~wall~~ *building envelope* insulation shall be as required by the most restrictive condition of Section 6.4.4.2 or Section 5, depending on whether the plenum is located in the roof, wall, or floor. Insulation resistance measured on a horizontal plane in accordance with ASTM C518 at a mean temperature of 75°F (23.9°C) at the installed thickness

Revise Section 9.6.1 as follows (I-P and SI):

9.6.1 Space-by-Space Method of Calculating Interior Lighting Power Allowance. Use the following steps to determine the interior lighting power allowance by the Space-by-Space Method:

a. …

b. In calculating the area of each space and subspace, the limits of the area are defined by the centerline of interior walls, the dividing line between subspaces, and the outside surface of *exterior walls* or *semi-exterior walls*. For the purposes of this section semi-exterior walls that separate semi-conditioned space from conditioned space shall be considered interior walls.

c. …

Revise Table 11.5.1 as follows (I-P and SI):

Table 11.5.1 Modeling Requirements for Calculating Design Energy Cost and Energy Cost Budget

…

5. Building Envelope,
Budget Building Design (Column B) Energy Cost Budget (ECB)
The budget building design shall have identical conditioned floor area and identical exterior dimensions and orientations as the proposed building design, except as follows:

a. …

b. …

c. No shading projections are to be modeled; fenestration shall be assumed to be flush with the ~~exterior~~ wall or roof.

…

7. Thermal Blocks—HVAC Zones Designed,
Proposed Building Design (Column A) Design Energy Cost (DEC)
Where HVAC zones are defined on HVAC design drawings, each HVAC zone shall be modeled as a separate thermal block.

Exceptions: Different HVAC zones may be combined to create a single thermal block or identical thermal blocks to which multipliers are applied, provided all of the following conditions are met:

1. The space-use classification is the same throughout the thermal block.
2. All HVAC zones in the thermal block that are adjacent to glazed *exterior walls* and glazed *semi-exterior walls* face the same orientation or their orientations are within 45 degrees of each other.
3. All of the zones are served by the same HVAC system or by the same kind of HVAC system.

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…

8. Thermal Blocks— HVAC Zones Not Designed,
Proposed Building Design (Column A) Design Energy Cost (DEC)
Where the HVAC zones and systems have not yet been designed, thermal blocks shall be defined based on similar internal load densities, occupancy, lighting, thermal and space temperature schedules, and in combination with the following:

a. Separate thermal blocks shall be assumed for interior and perimeter spaces. Interior spaces shall be those located more than 15 ft (5 m) from an exterior wall or *semi-exterior wall*. Perimeter spaces shall be those located closer than 15 ft (5 m) from an exterior wall or *semi-exterior wall*. A separate thermal zone does not need to be modeled for areas adjacent to semi-exterior walls that separate semi-conditioned space from conditioned space.

b. Separate thermal blocks shall be assumed for spaces adjacent to glazed exterior walls or glazed *semi-exterior walls*; a separate zone shall be provided for each orientation, except that orientations that differ by no more than 45 degrees may be considered to be the same orientation. Each zone shall include all floor area that is 15 ft (5 m) or less from a glazed perimeter wall, except that floor area within 15 ft (5 m) of glazed perimeter walls having more than one orientation shall be divided proportionately between zones.

c. Separate thermal blocks shall be assumed for spaces having floors that are in contact with the ground or exposed to ambient conditions from zones that do not share these features.

d. Separate thermal blocks shall be assumed for spaces having ~~exterior ceiling or~~ roof assemblies from zones that do not share these features.

…

Revise Section A2.4.1 as follows (I-P and SI):

A2.4 General. For the purpose of Section A1.2, the base attic roof assembly is a roof with nominal 4 in. (100 mm) deep wood as the lower chord of a roof truss or ceiling joist. … U-factors are provided for the following configurations:

a. …

b. Attic roof, advanced framing: full and even depth of insulation extending to the outside edge of ~~exterior~~ walls. Weighting factors are 90% full-depth insulation and 10% joists.

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ASHRAE is concerned with the impact of its members' activities on both the indoor and outdoor environment. ASHRAE's members will strive to minimize any possible deleterious effect on the indoor and outdoor environment of the systems and components in their responsibility while maximizing the beneficial effects these systems provide, consistent with accepted Standards and the practical state of the art.

ASHRAE's short-range goal is to ensure that the systems and components within its scope do not impact the indoor and outdoor environment to a greater extent than specified by the Standards and Guidelines as established by itself and other responsible bodies.

As an ongoing goal, ASHRAE will, through its Standards Committee and extensive Technical Committee structure, continue to generate up-to-date Standards and Guidelines where appropriate and adopt, recommend, and promote those new and revised Standards developed by other responsible organizations.

Through its *Handbook*, appropriate chapters will contain up-to-date Standards and design considerations as the material is systematically revised.

ASHRAE will take the lead with respect to dissemination of environmental information of its primary interest and will seek out and disseminate information from other responsible organizations that is pertinent, as guides to updating Standards and Guidelines.

The effects of the design and selection of equipment and systems will be considered within the scope of the system's intended use and expected misuse. The disposal of hazardous materials, if any, will also be considered.

ASHRAE's primary concern for environmental impact will be at the site where equipment within ASHRAE's scope operates. However, energy source selection and the possible environmental impact due to the energy source and energy transportation will be considered where possible. Recommendations concerning energy source selection should be made by its members.

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