CODE NOTES

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

BUILDING TECHNOLOGIES PROGRAM

2009 and 2012 IECC; ASHRAE 90.1-2007 and 2010

Vestibule Requirements in Commercial Buildings

The intent of the vestibule requirement is to reduce infiltration of air into a space, thereby addressing energy conservation and comfort issues for occupants located near primary entrance doors. The majority of infiltration comes through primary entrance doors that are typically used to access public areas, and have higher usage rates than doors classified for personnel use. Vestibules can reduce the infiltration losses (or gains) from wind and stack effects by creating an air lock entry.

Commercial building designers are required to install vestibules on primary entrance doors leading to and from spaces greater than or equal to 3,000 square feet (298 m^2), with some exceptions. Many designers are unclear on what is included in determining the 3,000 ft^2 that defines a space. For example, if an entrance door leading from a lobby is attached to a corridor with a combined total area of 3,000 ft^2, must the door meet the vestibule requirement? Similarly, which doors must have vestibules when several doors leave a space greater than or equal to 3,000 ft^2?

The 2009 and 2012 IECC require that primary entrance doors accessing spaces 3,000 ft^2 or greater have vestibules. This requirement typically applies to large "box" stores where the building entrance opens directly to a resale area, or to other occupancies with large lobbies (e.g., hotels). For office buildings with a lobbies connected to corridors with a combined total area of 3,000 ft^2, only those areas that cannot be closed off from the entrance door are included when determining if a vestibule is required. (See Figure 1).

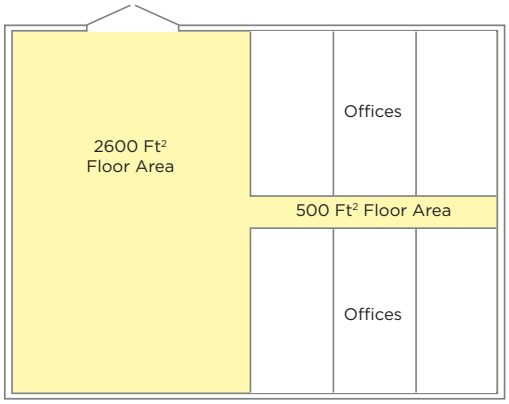

Figure 1.

ASHRAE 90.1-2007 and 2010 also require vestibules for entrance doors accessing spaces 3,000 ft^2 or greater but with some added requirements not present in the IECC. The first requirement is associated with vestibule envelope requirements. ASHRAE requires that the exterior envelope of a conditioned vestibule comply with the requirements

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Vestibule Requirements in Commercial Buildings *(Continued)*

for a conditioned space while the interior and exterior of an unconditioned vestibule must comply with the envelope requirements for a semiheated space. ASHRAE 90.1 also requires a minimum distance of 7 ft between closed interior and exterior vestibule doors. ASHRAE also contains exceptions for vestibules in Climate Zones 3-8 that do not appear in the IECC.

Plan Review

1. Verify that doors separating conditioned spaces from the exterior that do not have vestibules are exempt from the requirement.
2. Verify that for spaces larger than 3,000 ft^2 doors separating conditioned space from the exterior contain a vestibule, unless an exception applies.
3. Verify that the doors leading into and out of the vestibule are designed so that, in passing through the vestibule, it is not necessary for the interior and exterior doors to be open at the same time.
4. Verify that the building assemblies between the conditioned space and the vestibule meet the envelope requirements of the applicable code.

Inspection

1. Verify that the vestibule has been constructed according to the approved building plans and specifications.
2. Verify that the doors leading into and out of the vestibule are equipped with self-closing devices.
3. Verify that it is not necessary for the interior and exterior doors of the vestibule to be open at the same time.

Code Citations*

IECC 2009, Section 502.4.7 Vestibules

A door that separates conditioned space from the exterior shall be protected with an enclosed vestibule, with all doors opening into and out of the vestibule equipped with self-closing devices. Vestibules shall be designed so that in passing through the vestibule it is not necessary for the interior and exterior doors to open at the same time.

Exceptions:

1. Buildings in Climate Zones 1 and 2, as indicated in Figure 301.1 and Table 301.1.
2. Doors not intended to be used as a building entrance door, such as doors to mechanical or electrical equipment rooms.

2009 and 2012 IECC; ASHRAE 90.1-2007 and 2010

Vestibule Requirements in Commercial Buildings *(Continued)*

3. Doors opening directly from a sleeping unit or dwelling unit.
4. Doors that open directly from a space less than 3,000 ft^2 in area.
5. Revolving doors.
6. Doors used primarily to facilitate vehicular movement or material handling and adjacent personnel doors.

IECC 2012, Section C402.4.7 Vestibules
All building entrances shall be protected with an enclosed vestibule, with all doors opening into and out of the vestibule equipped with self-closing devices. Vestibules shall be designed so that in passing through the vestibule it is not necessary for the interior and exterior doors to open at the same time. The installation of one or more revolving doors in the building entrance shall not eliminate the requirement that a vestibule be provided on any doors adjacent to revolving doors.

Exceptions:

1. Buildings in Climate Zones 1 and 2.
2. Doors not intended to be used by the public, such as doors to mechanical or electrical equipment rooms, or intended solely for employee use.
3. Doors opening directly from a sleeping unit or dwelling unit.
4. Doors that open directly from a space less than 3,000 ft^2 (298 m^2) in area.
5. Revolving doors.
6. Doors used primarily to facilitate vehicular movement or material handling and adjacent personnel doors.

CODE NOTES

Vestibule Requirements in Commercial Buildings *(Continued)*

ASHRAE 90.1-2007/2010, Section 5.4.3.4 Vestibules

Building entrances that separate conditioned space from the exterior shall be protected with an enclosed vestibule, with all doors opening into and out of the vestibule equipped with self-closing devices. Vestibules shall be designed so that in passing through the vestibule it is not necessary for the interior and exterior doors to be open at the same time. Interior and exterior doors shall have a minimum distance between them of not less than 7 ft when in the closed position. The exterior envelope of conditioned vestibules shall comply with the requirements for a conditioned space. The interior and exterior envelope of unconditioned vestibules shall comply with the requirements for a semiheated space.

Exceptions:

a. Building entrances with revolving doors.
b. Doors not intended to be used as a building entrance.
c. Doors opening directly from a dwelling unit.
d. Building entrances in buildings located in Climate Zone 1 or 2.
e. Building entrances in buildings located in Climate Zone 3 (ASHRAE 90.1-2010), or Climate Zone 3 and 4 (ASHRAE 90.1-2007), that are less than four stoies above grade and less than 10,000 ft^2 in area.
f. Building entrances in buildings located in Climate Zone 5, 6, 7, or 8 that are less than 1,000 ft^2 in area.
g. Doors that open directly from a space that is less than 3,000 ft^2 in area and is separate from the building entrance.

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