ADDENDA

ANSI/ASHRAE Addendum c to
ANSI/ASHRAE Standard 160-2009

Criteria for Moisture-Control Design Analysis in Buildings

Approved by the ASHRAE Standards Committee on June 23, 2012; by the ASHRAE Board of Directors on June 27, 2012; and by the American National Standards Institute on June 28, 2012.

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FOREWORD

SSPC 160 changes Section 4.6 as indicated below. The changes are limited to Table 4.6.1 and the explanation of terms directly below the table. The changes are meant to simplify the calculation of wind-driven rain without significantly degrading the accuracy of the calculation. Because the calculation has large errors associated with it, the specificity of the old table did not improve accuracy. There is also considerable uncertainty about the effect of building height on rain deposition.

Note: *In this addendum, changes to the current standard are indicated in the text by underlining (for additions) and ~~strikethrough~~ (for deletions) unless the instructions specifically mention some other means of indicating the changes.*

Addendum c to Standard 160-2009

Modify the standard as follows.

4.6 Design Rain Loads on Walls [B-15]

Design rain loads must be determined for walls exposed to rain. In the absence of a comprehensive wind-driven rain analysis, the amount of rain striking a vertical surface shall be calculated using the following equation: [B-16]

$$r_{bv} = F_E \cdot F_D \cdot F_L \cdot U \cdot \cos\theta \cdot r_h \tag{4-6}$$

where

F_E = rain exposure factor
F_D = rain deposition factor
F_L = empirical constant, 0.2 kg·s/(m^3·mm) [SI], 0.46 lb·h/(ft^2·mi·in.) [I-P]
U = hourly average wind speed at 10 m (33 ft) height, m/s (mi/h)
θ = angle between wind direction and normal to the wall (See Figure 4.6.1)
r_h = rainfall intensity, horizontal surface, mm/h (in./h)
r_{bv} = rain deposition on vertical wall, kg/(m^2·h) [SI], lb/(ft^2·h) [I-P]

The exposure factor, F_E, is influenced by the topography surrounding the building and height of the building. Recommended values are given in Table 4.6.1. [B-17]

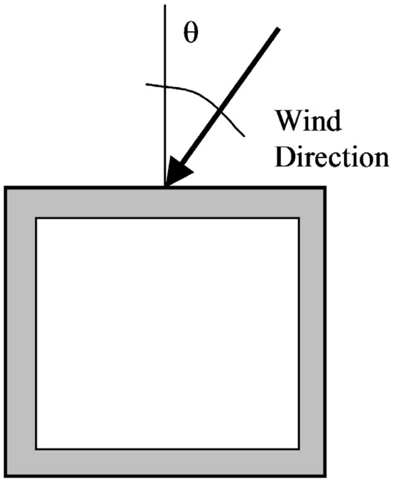

Figure 4.6.1 Plan view of building with definition of wind angle to exposed wall.

~~**Table 4.6.1 Exposure Factor**~~

~~Building Height, m (ft)~~	~~Type of Terrain~~		
	~~Severe~~	~~Medium~~	~~Sheltered~~
~~<10 (<33)~~	~~1.3~~	~~1.0~~	~~0.7~~
~~10-15 (33-49)~~	~~1.3~~	~~1.1~~	~~0.8~~
~~15-20 (49-66)~~	~~1.4~~	~~1.2~~	~~0.9~~
~~20-30 (66-98)~~	~~1.5~~	~~1.3~~	~~1.1~~
~~30-40 (98-131)~~	~~1.5~~	~~1.4~~	~~1.2~~
~~40-50 (131-164)~~	~~1.5~~	~~1.5~~	~~1.3~~
~~>50 (>164)~~	~~1.5~~	~~1.5~~	~~1.5~~

TABLE 4.6.1 Exposure Factor

Building Height, m (ft)	Type of Exposure Category		
	Severe	Medium	Sheltered
<10 (<33)	1.4	1.0	0.7
>10 and ≤ 20 (>33 and ≤ 66)	1.4	1.2	1.0
> 20 (> 66)	1.5	1.5	1.5

Severe exposure includes hilltops, coastal areas, and funneled wind. Sheltered exposure includes protection by ~~shelter from trees,~~ nearby buildings~~,~~ or ~~a valley~~ other permanent moderating features.

The following deposition factors shall be used:

a. Walls below a steep-slope roof: $F_D = 0.35$
b. Walls below a low-slope roof: $F_D = 0.5$
c. Walls subject to rain runoff: $F_D = 1.0$[B-18]

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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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7/12