SNOW LOADS (per ANSI/ASCE 7-02)

Notation:

C_e = exposure factor as determined from ASCE 7-02 Table 7-2

C_s = slope factor as determined from ASCE 7-02 Fig. 7-2

C_t = thermal factor as determined from ASCE 7-02 Table 7-3

h_b = height of balanced snow load determined by dividing p_s by γ

h_c = clear height from top of balanced snow load to (1) closest point on adjacent upper roof; (2) top of parapet; or (3) top of a projection on the roof, in feet

h_d = height of snow drift, in feet

I = importance factor as determined from ASCE 7-02 Table 7-4;

l_u = length of the roof upwind of the drift, in feet

p_d = maximum intensity of drift surcharge load, in pounds per square foot

p_f = snow load on flat roofs ("flat" = roof slope less than or equal to 5 degrees), in pounds per square foot

p_g = ground snow loads determined from ASCE 7-02 Fig 7-1 and/or ASCE 7-02 Table 7-1; or a site specific analysis, in pounds per square foot

p_s = sloped roof snow load in pounds per square foot

w = width of snow drift, in feet

γ = snow density in pounds per cubic foot as determined from ASCE 7-02 Eq. 7-4

ANALYSIS:

We have a class II, exposure B situation (see ASCE 7-02 Tables 1-1 and ASCE 7-02 Section 6.5.3 for clarification)

$p_s = C_s * P_f$ (in our case C_s = 1.0 because our roof can be considered "flat")

$p_f = 0.7 * C_e * C_t * I * P_g$

C_s =

C_e =

C_t =

I =

p_g =

p_f = → But since this cannot be less than I * p_g our p_f value becomes

I * pg = (see ASCE 7-02 7.3.4 for clarification)

p_s = **psf**

In our case a 5 psf rain on snow surcharge load must be applied (see ASCE 7-02 Section 7.10) therefore,

p_S = **psf**

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SNOW LOADS (cont.)

Snow drift calculations

h_b = height of balanced snow load determined by dividing p_s by γ
h_c = clear height from top of balanced snow load to (1) closest point on adjacent upper roof; (2) top of parapet; or (3) top of a projection on the roof, in feet
h_d = height of snow drift, in feet
w = width of snow drift, in feet
γ = snow density in pounds per cubic foot as determined from ASCE 7-02 Eq. 7-4
l_u = length of the roof upwind of the drift, in feet

$\gamma = 0.13 * p_g + 14$ (but can not be more than 30 lb/cu ft)

p_g =
γ = **lb/cu ft**

$h_b = p_s / \gamma$

$\mathbf{p_s}$ = psf
$\mathbf{h_b}$ = ft
$\mathbf{h_c}$ = **ft**
$\mathbf{h_c / h_b}$ =

****since $h_c / h_b > 0.2$ we must consider snow drift see ASCE 7-02 Section 7.7 for further explanation*

for leeward snow drifts:

$\mathbf{h_d}$ = **ft** (this value is found from ASCE 7-02 Fig. 7-9 based on p_g, and l_u)

maximum intensity of snow drift for leeward = $h_d * \gamma =$ psf

for windward snow drifts:

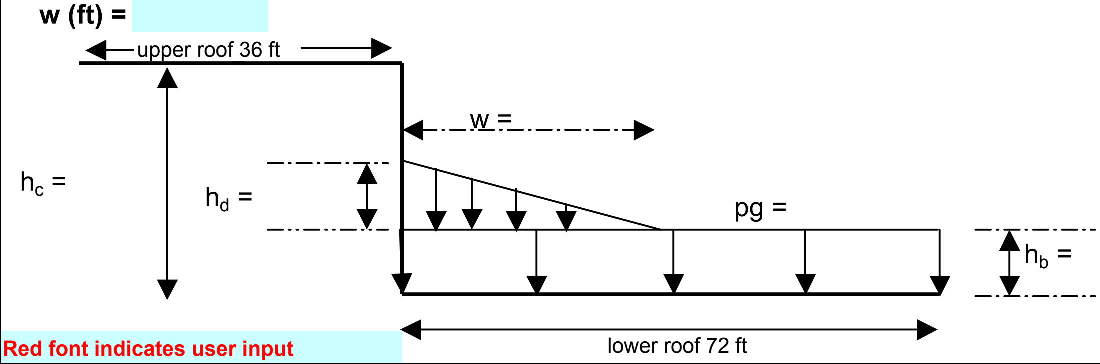
$\mathbf{h_d}$ = **ft**

maximum intensity of snow drift for windward = $h_d * \gamma =$ psf

Windward Controls **maximum intensity of snow drift =** **psf**

since $h_d < h_c$ drift width, w, = $4*h_d$

w (ft) =



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