STRUCTURAL CALCULATIONS

FOR

Snow Example 3

ASCE 7-05 Commentary
Code Search

Code: ASCE 7 - 05

Occupancy:

Occupancy Group = B Business

Occupancy Category & Importance Factors:

Occupancy Category = I
Wind factor = 0.87
Snow factor = 0.80
Seismic factor = 1.00

Type of Construction:

Fire Rating:
Roof = 1.0 hr
Floor = 2.0 hr

Building Geometry:

Roof angle (θ) 0.00 / 12 0.0 deg
Building length (L) 100.0 ft
Least width (B) 100.0 ft
Mean Roof Ht (h) 30.0 ft
Parapet ht above grd 0.0 ft
Minimum parapet ht 0.0 ft

Live Loads:

Roof
0 to 200 sf: 20 psf
200 to 600 sf: 24 - 0.02Area, but not less than 12 psf
over 600 sf: 12 psf

Floor
Typical Floor 50 psf
Lobbies & first floor corridors 100 psf
Corridors above first floor 80 psf
Mechanical 100 psf
Stairs & Exitways 100 psf
Balcony / Deck 50 psf
Partitions 15 psf
### Snow Loads:

**Monoslope**
- **Roof slope** = 0.0 deg
- **Horiz. eave to ridge dist (W)** = 100.0 ft
- **Roof length parallel to ridge (L)** = 100.0 ft

#### Type of Roof
- **Ground Snow Load** $P_g = 40.0$ psf
- **Importance Category** = I
- **Importance Factor** $I = 0.8$
- **Thermal Factor** $C_t = 1.20$
- **Exposure Factor** $C_e = 1.0$

#### Pf = $0.7*Ce*ct*I*Pg$
- **Pf min** = 16.0 psf

#### Flat Roof Snow Load
- **Pf = 26.9** psf
- **Rain on Snow Surcharge Angle** = 2.00 deg

#### Code Maximum Rain Surcharge
- **Code maximum** = 5.0 psf

#### Rain on Snow Surcharge
- **= 0.0** psf

#### Design Roof Snow Load ($P_s = \text{"balanced" snow load}$)
- **= 26.9** psf

#### Building Official Minimum
- **=**

---

### Leeward Snow Drifts - from adjacent higher roof

- **Upper roof length** $L_u = 100.0$ ft
- **Projection height** $h = 10.0$ ft
- **Building separation** $s = 0.0$ ft
- **Adjacent structure factor** = $1.00$
- **Snow density** $\gamma = 19.2$ pcf
- **Balanced snow height** $h_b = 1.40$ ft
- **$h_c = 8.60$ ft**

#### Therefore, design for drift
- **Drift height** $h_d = 3.81$ ft
- **Drift width** $w = 15.23$ ft
- **Surcharge load:** $p_d = \gamma h_d = 73.1$ psf

### Windward Snow Drifts - Against walls, parapets, etc more than 15' long

- **Building roof length** $L_u = 170.0$ ft
- **Projection height** $h = 10.0$ ft
- **Snow density** $\gamma = 19.2$ pcf
- **Balanced snow height** $h_b = 1.40$ ft
- **$h_c = 8.60$ ft**

#### Therefore, design for drift
- **Drift height** $h_d = 3.63$ ft
- **Drift width** $w = 14.50$ ft
- **Surcharge load:** $p_d = \gamma h_d = 69.6$ psf