

2007 CBC Wind Loads -- IR 16-7: Alternate Method

$$p = q_s \cdot K_z \cdot C_{net} \cdot I \cdot K_{zt}$$

Wind Speed: 85 mph

Exposure: C

where:

$q_s = 18.5$ psf

$K_{zt} = 1.00$ Figure 6-4

$I = 1.00$ Importance Factor

$\alpha = 9.5$

$z_g = 900$ ft

Roof Slope = 4 Rise to 12 Horiz.

$C_{net} = 0.43$ (IWW) Inward @ Windward Wall

$C_{net} = 0.51$ (OLW) Outward @ Leeward Wall

$C_{net} = -0.05$ (IWR) Inward @ Windward Roof

$C_{net} = -0.73$ (OWR) Outward @ Windward Roof

$C_{net} = 0.66$ (OLR) Outward @ Leeward Roof

$C_{net} = 0.66$ (OPR) Outward @ Parallel To Ridge

$C_{net} = 1.28$ (IWW) Inward @ Windward Parapet Wall

$C_{net} = 0.85$ (OLW) Outward @ Leeward Parapet Wall

Wind Loading
@ Roof - Lines 1 to 2

Mean Roof Height = 11.0 feet
 $K_z = 0.85$

| Tributary Area | Normal Pressure | Resultant Horizontal Force |
|----------------|-----------------|----------------------------|
| 4.50 feet @ | 6.8 psf = | 30 lbs. (IWW) |
| 4.50 feet @ | 8.0 psf = | 36 lbs. (OLW) |
| 4.50 feet @ | -0.8 psf = | -4 lbs. (IWR) |
| 4.50 feet @ | 10.4 psf = | 47 lbs. (OLR) |
| 0.00 feet @ | 20.1 psf = | 0 lbs. (IWP) |
| 0.00 feet @ | 13.3 psf = | 0 lbs. (OLP) |

$$F_p = 110 \text{ plf - horiz.}$$

V line 1 = 1.97 kips Answer Part A

Wind Loading "Balloon Framed"
@ Eaves

Mean Roof Height = 11.0 feet
 $K_z = 0.85$

| Tributary Area | Normal Pressure | Resultant Horizontal Force |
|----------------|-----------------|----------------------------|
| 4.50 feet @ | 6.8 psf = | 30 lbs. (IWW) |
| 4.50 feet @ | 8.0 psf = | 36 lbs. (OLW) |
| 0.00 feet @ | -0.8 psf = | 0 lbs. (IWR) |
| 0.00 feet @ | 10.4 psf = | 0 lbs. (OLR) |
| 0.00 feet @ | 20.1 psf = | 0 lbs. (IWP) |
| 0.00 feet @ | 13.3 psf = | 0 lbs. (OLP) |

$$F_p = 66 \text{ plf - horiz.}$$

Wind Loading
@ Ridge

Mean Roof Height = 11.0 feet
 $K_z = 0.85$

| Tributary Area | Normal Pressure | Resultant Horizontal Force |
|----------------|-----------------|----------------------------|
| 6.75 feet @ | 6.8 psf = | 46 lbs. (IWW) |
| 6.75 feet @ | 8.0 psf = | 54 lbs. (OLW) |
| 0.00 feet @ | -0.8 psf = | 0 lbs. (IWR) |
| 0.00 feet @ | 10.4 psf = | 0 lbs. (OLR) |
| 0.00 feet @ | 20.1 psf = | 0 lbs. (IWP) |
| 0.00 feet @ | 13.3 psf = | 0 lbs. (OLP) |

$$F_p = 100 \text{ plf - horiz.}$$

V line A = 1.11 kips Answer Part A

Wind Loading "Platform Framed"
@ Eaves

Mean Roof Height = 11.0 feet
 $K_z = 0.85$

| Tributary Area | Normal Pressure | Resultant Horizontal Force |
|----------------|-----------------|----------------------------|
| 4.50 feet @ | 6.8 psf = | 30 lbs. (IWW) |
| 4.50 feet @ | 8.0 psf = | 36 lbs. (OLW) |
| 0.00 feet @ | -0.8 psf = | 0 lbs. (IWR) |
| 0.00 feet @ | 10.4 psf = | 0 lbs. (OLR) |
| 0.00 feet @ | 20.1 psf = | 0 lbs. (IWP) |
| 0.00 feet @ | 13.3 psf = | 0 lbs. (OLP) |

$$F_p = 66 \text{ plf - horiz.}$$

Wind Loading
@ Ridge

Mean Roof Height = 11.0 feet
 $K_z = 0.85$

| Tributary Area | Normal Pressure | Resultant Horizontal Force |
|----------------|-----------------|----------------------------|
| 9.00 feet @ | 6.8 psf = | 61 lbs. (IWW) |
| 9.00 feet @ | 8.0 psf = | 72 lbs. (OLW) |
| 0.00 feet @ | -0.8 psf = | 0 lbs. (IWR) |
| 0.00 feet @ | 10.4 psf = | 0 lbs. (OLR) |
| 0.00 feet @ | 20.1 psf = | 0 lbs. (IWP) |
| 0.00 feet @ | 13.3 psf = | 0 lbs. (OLP) |

$$F_p = 133 \text{ plf - horiz.}$$

V line A = 1.33 kips Answer Part A