4. $H/L_h \geq 0.2$.
5. H is greater than or equal to 15 ft (4.5 m) for Exposure C and D and 60 ft (18 m) for Exposure B.

26.8.2 Topographic Factor

The wind speed-up effect shall be included in the calculation of design wind loads by using the factor K_{zt}:

$$K_{zt} = (1 + K_1K_2K_3)^2 \qquad (26.8\text{-}1)$$

where K_1, K_2, and K_3 are given in Fig. 26.8-1.

If site conditions and locations of structures do not meet all the conditions specified in Section 26.8.1 then $K_{zt} = 1.0$.

26.9 GUST-EFFECTS

26.9.1 Gust-Effect Factor: The gust-effect factor for a rigid building or other structure is permitted to be taken as 0.85.

26.9.2 Frequency Determination

To determine whether a building or structure is rigid or flexible as defined in Section 26.2, the fundamental natural frequency, n_1, shall be established using the structural properties and deformational characteristics of the resisting elements in a properly substantiated analysis. Low-Rise Buildings, as defined in 26.2, are permitted to be considered rigid.

26.9.2.1 Limitations for Approximate Natural Frequency

As an alternative to performing an analysis to determine n_1, the approximate building natural frequency, n_a, shall be permitted to be calculated in accordance with Section 26.9.3 for structural steel, concrete, or masonry buildings meeting the following requirements:

1. The building height is less than or equal to 300 ft (91 m), and
2. The building height is less than 4 times its effective length, L_{eff}.

The effective length, L_{eff}, in the direction under consideration shall be determined from the following equation:

$$L_{eff} = \frac{\sum_{i=1}^{n} h_i L_i}{\sum_{i=1}^{n} h_i} \qquad (26.9\text{-}1)$$

The summations are over the height of the building where

h_i is the height above grade of level i
L_i is the building length at level i parallel to the wind direction

26.9.3 Approximate Natural Frequency

The approximate lower-bound natural frequency (n_a), in Hertz, of concrete or structural steel buildings meeting the conditions of Section 26.9.2.1, is permitted to be determined from one of the following equations:

For structural steel moment-resisting-frame buildings:

$$n_a = 22.2/h^{0.8} \qquad (26.9\text{-}2)$$

For concrete moment-resisting frame buildings:

$$n_a = 43.5/h^{0.9} \qquad (26.9\text{-}3)$$

For structural steel and concrete buildings with other lateral-force-resisting systems:

$$n_a = 75/h \qquad (26.9\text{-}4)$$

For concrete or masonry shear wall buildings, it is also permitted to use

$$n_a = 385(C_w)^{0.5}/h \qquad (26.9\text{-}5)$$

where

$$C_w = \frac{100}{A_B}\sum_{i=1}^{n}\left(\frac{h}{h_i}\right)^2 \frac{A_i}{\left[1+0.83\left(\frac{h_i}{D_i}\right)^2\right]}$$

where

h = mean roof height (ft)
n = number of shear walls in the building effective in resisting lateral forces in the direction under consideration
A_B = base area of the structure (ft^2)
A_i = horizontal cross-section area of shear wall "i" (ft^2)
D_i = length of shear wall "i" (ft)
h_i = height of shear wall "i" (ft)

26.9.4 Rigid Buildings or Other Structures

For rigid buildings or other structures as defined in Section 26.2, the gust-effect factor shall be taken as 0.85 or calculated by the formula:

$$G = 0.925\left(\frac{1+1.7g_Q I_{\bar{z}} Q}{1+1.7g_v I_{\bar{z}}}\right) \qquad (26.9\text{-}6)$$

$$I_{\bar{z}} = c\left(\frac{33}{\bar{z}}\right)^{1/6} \qquad (26.9\text{-}7)$$