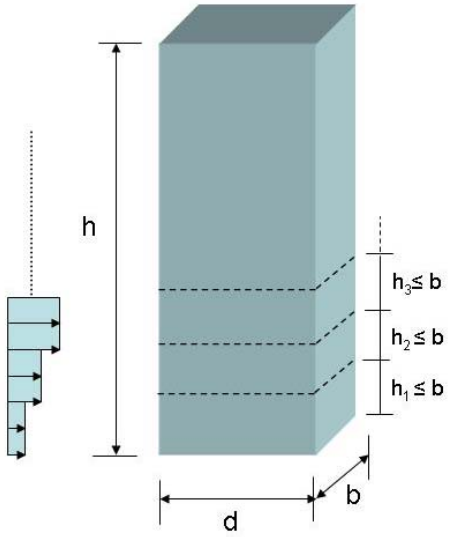

Figure 5.1. Calculation of wind loads along the height of the building.

In Eq. 5.1, the correlation coefficient C_s accounts for the fact that the points on the surface do not experience the maximum wind pressure all at the same time. The resonance coefficient C_d accounts for the increase in the building's displacements due to the turbulance-induced resonance vibrations of the building. They are calculated from the following equations:

$$C_s = \frac{1+7I_w(z_r)\sqrt{B^2}}{1+7I_w(z_r)} \qquad \text{and} \qquad C_d = \frac{1+7I_w(z_r)\sqrt{B^2+R^2}}{1+7I_w(z_r)\sqrt{B^2}} \qquad (5.2a)$$

or

$$C_s C_d = \frac{1+7I_w(z_r)\sqrt{B^2+R^2}}{1+7I_w(z_r)} \qquad (5.2b)$$

In Eqs. 5.2, z_r denotes the reference height in meters, which can be taken as the 60% of the total height (i.e., $z_r = 0.6h$), and $I_w(z_r)$ is the turbulance intensity at the reference height (see Eq. 3.8). B^2 and R^2 are the correlation factor and the resonance factor, respectively. The expressions given by Eq. 5.2 are valid for buildings whose vibrations are dominated by the first mode.