$$q_{\mathrm{p}}(z) = \frac{1}{2} \cdot \rho \cdot \left[V(z,t) \right]_{\max}^{2} \tag{4.1}$$

where $|V(z,t)|_{\max}$ is the maximum wind velocity at height z, as given by Eq. 3.11, and ρ is the density of the air which can be taken as $\rho = 12.5\ kg/m^3$. By using Eq. 3.11 in Eq. 4.1, and noting that $\bar{w}_{\max} << V_m(z)$, we can approximate the maximum wind pressure by the following equation

$$q_{\mathrm{p}}(z) \approx \frac{1}{2} \rho V_{\mathrm{m}}^{2}(z) + \rho V_{\mathrm{m}}(z) \bar{w}_{\max} \tag{4.2}$$

Using Eqs. 3.7 and 3.8, we can write:

$$q_{\mathrm{p}}(z) \approx \frac{1}{2} \rho V_{\mathrm{m}}^{2}(z) \left[1 + 7 I_{\mathrm{w}}(z) \right] \quad \text{or} \quad q_{\mathrm{p}}(z) \approx C_{\mathrm{q}}(z) q_{\mathrm{b}} \tag{4.3}$$

where q_{b} is the basic wind pressure and $C_{\mathrm{q}}(z)$ is the height-dependent pressure coefficient. Using Eq. 3.2, they are defined as:

$$q_{\mathrm{b}} = \frac{1}{2} \rho V_{\mathrm{b}}^{2} \quad \text{and} \quad C_{\mathrm{q}}(z) = C_{\mathrm{e}}^{2}(z) \cdot C_{\mathrm{t}}^{2} \cdot \left[1 + 7 I_{\mathrm{w}}(z) \right] \tag{4.4}$$

For the five terrain types in Table 3.1, the variation of $C_{\mathrm{q}}(z)$ with height is plotted in Fig. 4.1, assuming that C_{t}=1.