The correlation factor, B^2, is calculated from the following equation:

$$B^2 = \frac{1}{1+0.9\left[\dfrac{b+h}{L(z_{\mathrm{r}})}\right]^{0.63}} \tag{5.3}$$

where

b : Width of the building in meters in the direction perpendicular to the wind flow.

h : Height of the building in m.

$L(z_r)$: Turbulance length in meters at the reference height of $z_{\mathrm{r}} = 0.6h$ (see Eq. 3.9).

The resonance factor R^2 is calculated from the following equation:

$$R^2 = \frac{\check{s}^{\,2}}{2\delta} \cdot S_{\mathrm{L}}(z_{\mathrm{r}}, f_{\mathrm{o}}) \cdot R_{\mathrm{h}}(\eta_{\mathrm{h}}) \cdot R_{\mathrm{b}}(\eta_{\mathrm{b}}) \tag{5.4}$$

where

δ : Logarithmic decrement of the first-mode vibrations of the building.

f_0 : Frequency of the first mode (in Hz).

$S_L(z_r, f_0)$: Turbulance power spectral density function at z_r, f_0 (see Eq. 3.10).

$R_h(\eta_h)$: Aerodynamic addmitance function in the vertical direction.

$R_h(\eta_h)$: Aerodynamic addmitance function in the horizontal direction.

The logarithmic decrement δ can be calculated in terms of the damping ratio, ξ_0 , for the first mode as

$$\delta = \frac{2\check{s}\,\xi_{\mathrm{o}}}{\sqrt{1-\xi_{\mathrm{o}}^2}} \approx 2\check{s}\,\xi_{\mathrm{o}} \tag{5.5}$$

For buildings whose vibrations are dominated by the first mode, the aerodynamic admittance functions $R_h(\eta_h)$ and $R_b(\eta_b)$ can be approximated from the following equations: