If the predicted reponse values due to vortex shedding exceed the design or serviceability limits, some preventive measures can be taken to reduce them, although they are often difficult and too expensive to implement, particularly for tall buildings. They include increasing the natural frequency of the structure by increasing stiffness, increasing the damping by using additional dampers, and reducing the across-wind forces by changing the cross-sectional shape of the building, such as rounding the corners of a sharp-edged rectangular.

The study of across-wind vibrations of any building with unusual geometry and height requires wind tunnel testing.

8. WAKE BUFFETING

The buildings whose height-to-width ratio is four or greater, and located on the leeward side (i.e., back) of a similar size building may experience additional vibrations due to the turbulance generated by the presence of the building in front. This is known as *Wake Buffeting*. Wake buffeting can be neglected if any one of the following two conditions is satisfied:

(a) The distance between the two buildings is 25 times or more of the across-wind width of the building in front.

(b) The natural frequency of the subject building is greater than 1.0 *Hz*.

Otherwise, wake buffeting should be accounted for in the design. This usually requires wind tunnel tests.

9. WIND TUNNEL TESTS

Wind tunnel tests are required for structures that are not regular and/or likely to have unusual wind response characteristics. They include

1. Structures that are spatially irregular and very tall.
2. Structures that are very flexible with natural frequencies below 1.0 Hz.
3. Structures that are susceptible to vortex shedding, galloping, or wake buffeting.
4. Structures that are susceptible to wind-induced human discomfort.
5. Structures whose wind response requires a more accurate estimation of response and/or curtain wall pressures.

Wind tunnels tests can be used as an alternative to the numerical procedures presented above.

A wind tunnel test should satisfy the following conditions:

1. The variation of average wind velocity with height should be matched.
2. Macro- and micro-length scales of turbulance should be matched.
3. The effects of Reynolds number on pressures and forces should be minimized.