

Tall Buildings



CPP 

Wind Engineering and Airflow Solutions
for the built environment



The value of wind tunnel studies



Because very few wind-loading codes address the specific requirements of tall buildings, wind tunnel testing is the standard method of determining wind loads on the cladding and structural frames of skyscrapers.

Wind tunnel studies can enhance the efficiency and reliability of tall building designs. Throughout the testing process, we work closely with the design team to increase efficiency and reduce material use. On one recent project, we saved our client several thousand tons of structural steel by suggesting minor, architecturally insignificant, aerodynamic modifications that reduced the wind loads by up to 20%.

To keep tall buildings comfortable for occupants, the wind's effects must be considered. Buildings move when the wind blows but if the wind-induced motion is excessive or regularly perceptible, occupants can become uncomfortable or even alarmed. Aerodynamic modifications, structural modifications, or the addition of damping systems can reduce the building's motion to a level that ensures occupant comfort.





Wind-tunnel studies can also address:

Local wind pressures: Unlike wind loading codes, wind-tunnel tests address the unique geometry of your building, saving money and materials where local pressures are lower and increasing safety and reliability where they are higher.

Fire safety: To prevent smoke from being drawn into a stairwell, air pressure within the stairwell must be greater than the external pressure at the openings. Computational methods combined with wind-tunnel tests show how pressures outside the building affect the flow of smoke inside.

Ventilation: The energy used by mechanical ventilation systems can be reduced by taking advantage of prevailing wind pressures. Wind-tunnel tests can evaluate the potential for natural ventilation and determine the need for mechanical supplementation. Testing can also ensure that building exhausts do not re-enter the building that produced them or affect the surrounding buildings or pedestrian areas.

Helipads: Rooftop helicopter landing pads offer several challenges. Air intakes, commonly located on the roof, can ingest helicopter exhaust. Often, wind shear across the roof will adversely affect landing conditions for helicopters. Wind tunnel studies can evaluate these issues and identify solutions.

Downwash: Buildings that are significantly taller than their surroundings generate downwash. In many cities, downwash is strong enough to cause pedestrian discomfort or to interfere with the operation of doors. Wind-tunnel testing can identify ways to reduce these undesirable effects.

Wind engineering and airflow analysis studies can also investigate snow drifting on or around the building, the effects of surrounding topography on wind conditions at the site, and many other project-specific situations.



efficiency

reliability

comfort

Worldwide projects



Wind tunnel studies, computational fluid dynamics, and mathematical analyses are complementary methods that give CPP a wide range of resources to apply to your project. Our strategy is to integrate all of our knowledge and experience to provide you with reliable, accurate solutions that add value to your project.

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Quality, reliability, value.