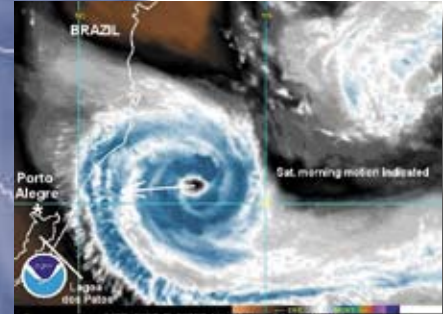


Hurricanes, Typhoons, Tropical Cyclones



CPP 

Wind Engineering and Airflow Solutions
for the built environment

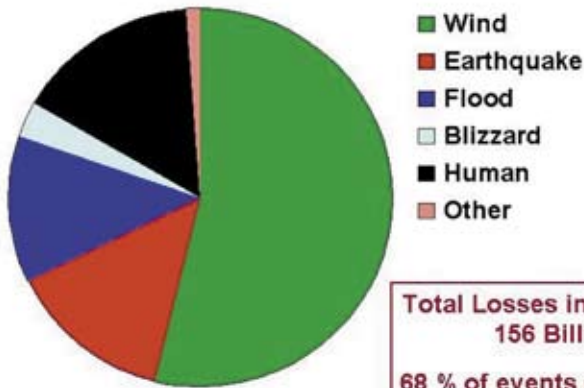


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risks *Hurricanes and typhoons* are regional terms for severe tropical cyclones, some of the most powerful storms on earth. Global insurance statistics show that windstorms account for more losses than earthquakes, floods, and human damage combined. Severe tropical cyclones are responsible for a large proportion of wind-caused losses. Wind engineering is a key tool in protecting structures, buildings, their contents and occupants from the effects of these destructive storms.

During a tropical cyclone, building damage often occurs because a small section of the building envelope fails. This often leads to failure of much larger areas of the envelope because of increased internal pressures, with additional damage to the building's contents from encroaching water.

40 Worst Disaster Property Insurance Losses 1970 - 2002



Total Losses in 2002 USD
156 Billion
68 % of events since 1990
81 % of loss since 1990

From Sigma No 2/ 2003, Swiss Re



solutions

By consulting our wind engineers early in the design or redevelopment process, you can optimize the reliability and economy of your project. Our expert staff can alert you to areas of particular risk and offer mitigation measures and strategies that will add to the efficiency and integrity of your project's design.

CPP offers several services to help you with new building designs and to check the integrity of existing buildings and structures.

- Site-specific **wind climate analysis** to determine levels of risk, including analysis of meteorological data, numerical simulations, and assessment of relevant local effects, such as topography.
- Wind-tunnel tests to determine **wind-induced structural loads**. Because we can incorporate directional wind speeds and account for the precise building shape, these tests often lead to lower loads than those predicted by more general code-based approaches, allowing greater efficiency in structural design and use of materials.
- Wind-tunnel tests to determine **local wind pressures**. Although wind loading codes often overestimate cladding and structural loads over most of the wall area, they can *underestimate* wind loads around a few specific areas or unusual geometries. Testing will allow you to confidently specify appropriate building components.
- **Forensic investigations** following failure. Wind engineering analyses can help identify contributing factors in wind-induced failures.

Expert wind engineering of buildings and structures in hurricane, typhoon, and tropical cyclone-prone regions is a key strategy to reduce risk and capital costs.



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.