



Computational Fluid Dynamics (CFD)

Services:

Building Acoustics

Wind and Snow Loading

Environmental Noise

Air Quality Studies

Structural Wind Loading

Wind Tunnel Testing

Cladding Pressures

Long Span Roofs

Control of Mechanical Vibrations

Computational Fluid Dynamics

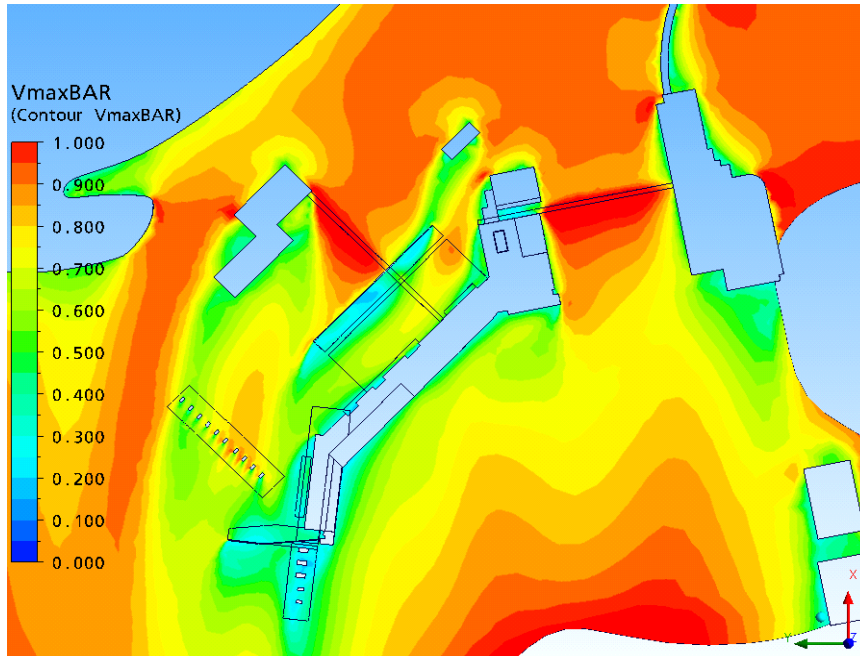
Microclimate Engineering

Design of Mass Dampers

Computational Fluid Dynamics (CFD) is a computer simulation method based on mathematical modelling of fluid flow using discrete elements. The 3-dimensional space around a building or other structure is divided into a large number of tiny elements (of which there may be millions). Each element possesses the physical attributes which describes the flow field. When the equations for each element are combined and solved, a continuous picture emerges of the desired flow quantity, including pressure, velocity, temperature, or any other specified quantity of interest. By taking advantage of state-of-the-art computer advancements in high speed and parallel processing, the technique represents a powerful companion tool to the physical wind tunnel. In essence, CFD creates a 'virtual wind tunnel' which is capable of solving complex problems. Ever improving technology and increasing software sophistication, is rapidly taking the CFD tool out of the laboratory and into the real world to solve complex and practical problems in wind engineering.

GmE has invested in the development of in-house know-how for applying this technology and made it available in our main stream of engineering services. It has become a versatile and powerful addition especially when combined with our physical wind tunnel testing capability.

The CFD approach has been applied to solve problems relating to pedestrian level wind comfort, cladding pressures on buildings, as well as pollution dispersion.



CFD Results Showing Wind Speeds over a Large Development Project, Wind Tunnel model of the same project.

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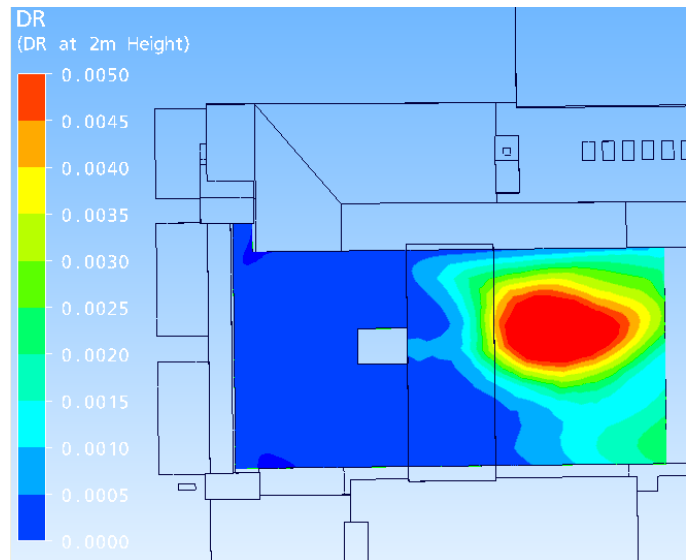
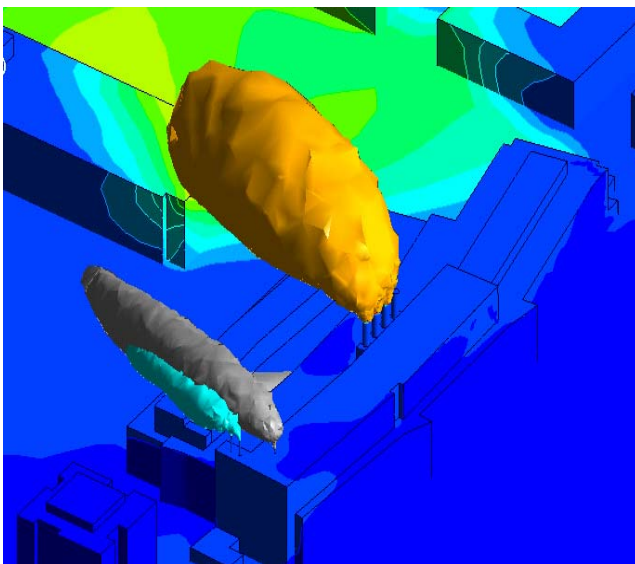
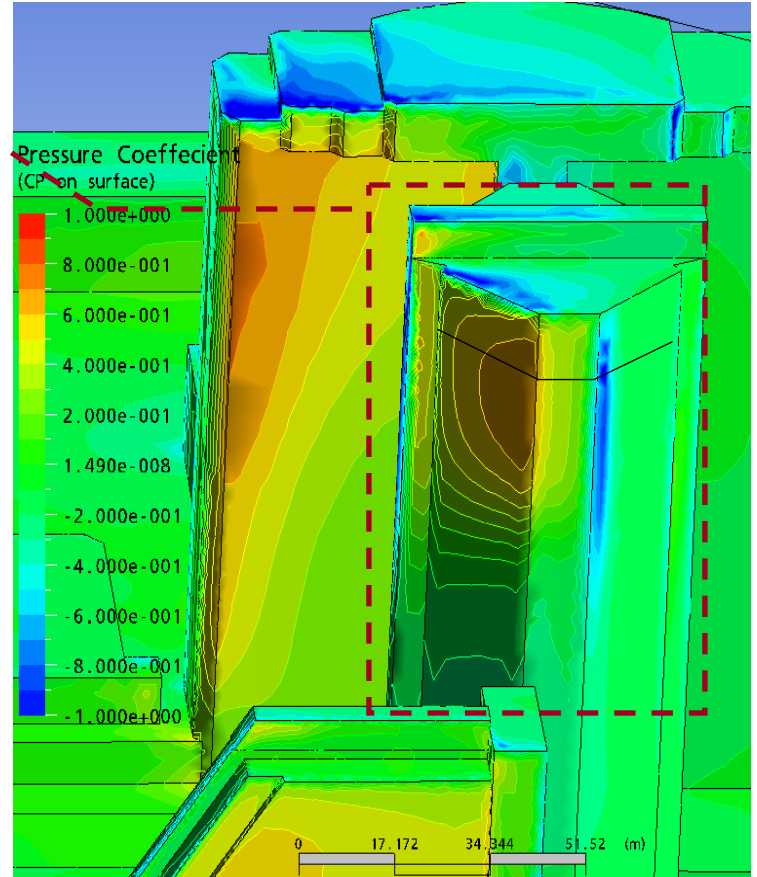
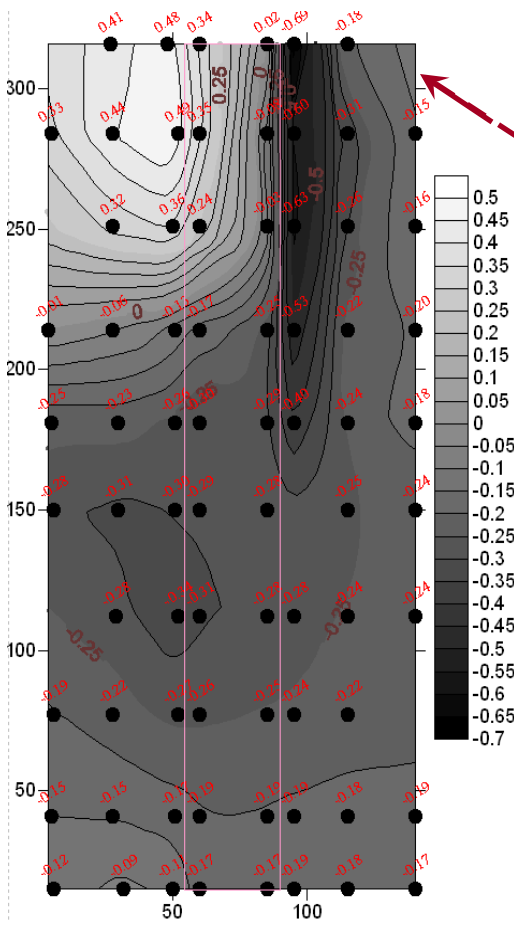
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Computational Fluid Dynamics (CFD)

Comparison of CFD (Right) and Wind Tunnel Cladding Pressures (Left) For A Tall Building



Modelling of Stack Gas Dispersion in the Atmosphere