



**CHAM Product Update**  
**PHOENICS – Your Gateway to CFD Success**

**PHOENICS Direct**  
**Urban-VWT** Mk1.0 Apr 2015

**[Urban – Virtual Wind Tunnel]**

**CFD software for fluid flow simulation for the external built environment**

PHOENICS-Direct is a low-cost, simplified user interface for CHAM's PHOENICS CFD software package. The **Urban-VWT**, embodied within PHOENICS Direct, simulates wind flow around buildings and other structures. Its menu based interface leads the user directly to just the capabilities required, and produces the needed results.

The function of **Urban-VWT** is to simulate the air flow around individual or groups of buildings, incorporating measured wind statistics to obtain yearly averaged results for the modelled wind direction. It will predict:

- Forces on the exterior of buildings, roofs and walls.
- Pedestrian comfort information including:
  - Wind Amplification Factors.
  - Probability of the wind speed to exceed a set threshold value
  - NEN8100 Dutch standard for Wind Comfort and Wind Danger in the Built Environment.
  - Other pedestrian wind comfort standards can be implemented.

The **Urban-VWT** is intended for architects, building engineers, urban planners, local authorities and environment engineers. Urban-VWT enables users to visualise, understand, evaluate and refine the air-flow patterns in steady-state scenarios, in micro- as well as macro-scale. Transient (time-dependent) conditions are straightforward to implement, if required.

The **Urban-VWT** offers:

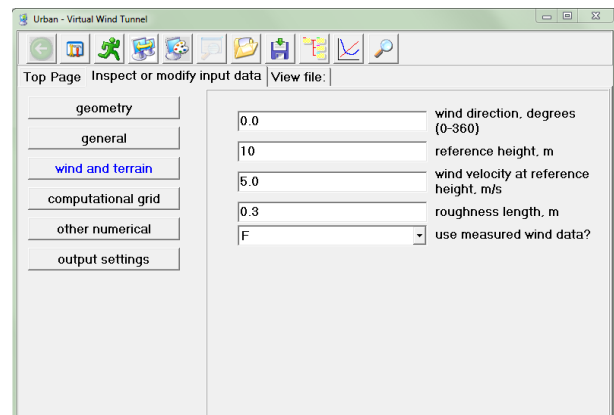
- CAD import features.
- Automatic grid generation with refinement in the region of interest.
- Grid aligned with the prevailing wind direction to avoid numerical-diffusion inaccuracies.
- Wind and wind profiling.
- Incorporation of measured wind statistics to the results.





The **Urban-VWT** inputs are:

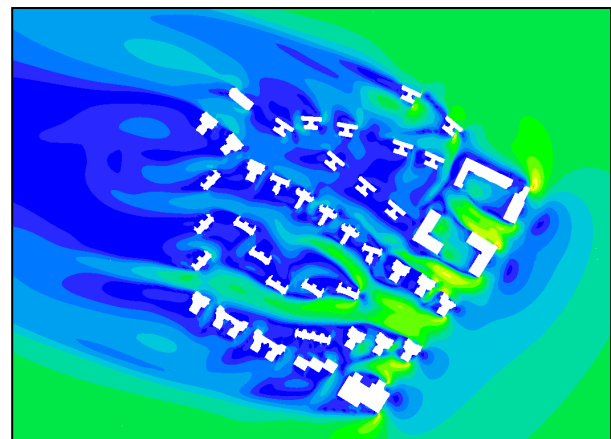
- CAD geometry file for the building(s).
- Size of the domain to simulate.
- Wind profile characteristics.
- Measured wind statistics.
- Size and position of a region of special interest.
- Resolution in the region of interest and the surrounding buildings.
- Configuration of result plots
- Other basic numerical settings.



Urban-VWT interface: Wind and terrain menu

The **Urban-VWT** can generate automatically plots for:

- Pedestrian wind comfort results at a user defined height
  - Wind Amplification Factor
  - Probability of the wind speed to exceed a set threshold value
  - NEN8100 Dutch standard for Wind Comfort and Wind Danger in the Built Environment.
- Wind forces
  - Pressure coefficients on the buildings
- Air flow patterns
  - Turbulence intensity
  - Streamlines



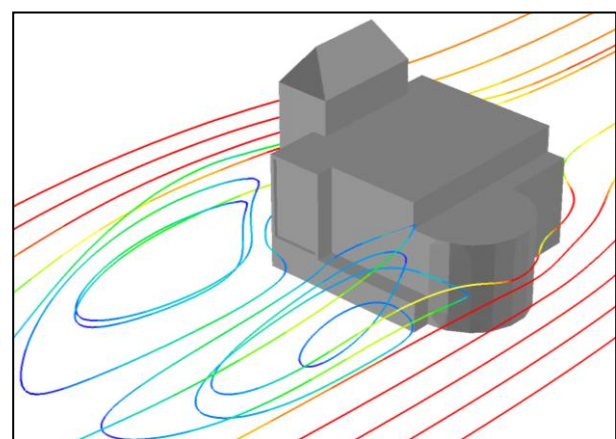
Wind Amplification Factor @ 2m height for E-S-E wind direction

**Urban-VWT** applications include:

- Pedestrian comfort
- Wind loading on structures
- Cityscape street canyons

The **Urban-VWT** displays:

- Building geometry
- Velocity vectors
- Streamlines
- Iso-surfaces
- Contour plots
- Surface contours & vectors
- Animated results



Velocity streamlines over a single building

For further information contact [Sales@cham.co.uk](mailto:Sales@cham.co.uk) or call +44 (0)20 8947 7651