Wind action on buildings and structures

In order to ensure safe and economical performance of buildings and structures, architects, structural engineers, building services engineers and building component manufacturers must consider the effects of wind action. BRE has extensive experience of all aspects of wind action on and around buildings and structures. We provide authoritative and independent advice at all stages of the design process, from conceptual design through to remedial work and refurbishment.

Wind tunnel testing

Wind tunnel testing can provide reliable and rapid assessments of wind action on and around buildings and structures. Using state-of-the-art wind tunnels we can accurately simulate natural wind conditions in environments ranging from open country to city centres. We can determine:

• cladding and structural wind loads
• structural dynamic response and accelerations
• wind environment and pedestrian comfort
• optimum positioning of HVAC inlets and exhausts and smoke vents.

Flow visualisation and professional video filming is available. All wind tunnel testing complies with the requirements of BS699: Part 2, and results are presented in a user-friendly, easy-to-use format.

Performance testing

Using the BRERWULF system we can simulate any pattern of wind loading on elements of up to 5m x 3m. Uses include:

• static and dynamic performance testing of cladding and roofing systems
• proof testing of prototype systems
• certification
• low-cycle fatigue testing
• forensic investigations of wind-damaged elements.
Wind consultancy

Our consultancy services range from simple desk studies to full-scale on-site investigations and monitoring of buildings and structures. This includes:

• calculation of wind loads using codes and standards
• assessment of wind speeds over complex topography
• advice on strategies for mitigating high wind speeds around buildings
• checking wind loading calculations and assessing results from wind tunnel studies
• expert witness reports and investigations
• investigation and assessment of structures after wind damage
• numerical modelling of air flows and pressures using computational fluid dynamics (CFD)
• monitoring pressures, forces, accelerations, natural frequencies and model shapes of buildings and structures
• monitoring wind characteristics at heights of up to 30m.

BRE also provides advice on:
• wind environment
• pollution dispersion

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