WIND LOADS ON INDUSTRIAL STRUCTURES

Helping designers achieve safe, optimized and innovative structures
When wind interacts with a structure, it can affect its safety, cost and habitability. We help you understand exactly how the wind affects various aspects of your design, from loading on structural components to the comfort of building occupants. This knowledge, delivered at the right time, allows you to truly optimize the design. Instead of chasing last-minute fixes, you’re free to focus on efficient and innovative solutions.

Explore Innovations
- Understand and design for unanticipated aerodynamic behavior in slender structures
- Enhance performance-based design by going beyond code compliance to a true understanding of code intent
- Safely undertake lighter, material-efficient and more flexible designs

Meet Challenges
- Ensure resiliency for strong wind events, reducing the risk of costly cascading failures that may result in environmental spills and possibly lengthy downtime of production.
- Remediate and upgrade existing structures effectively at the least cost

Fulfill Expectations
- Meet or exceed engineering code requirements with trusted recommendations
- Inform the entire project team with easy-to-understand presentation of wind loads

Create Opportunities
- Save money by spending capital on structures where it’s most effective
- Effectively use structural changes, shape changes and damping systems for optimization, by assessing wind issues early
We study a broad range of industrial structures. Projects come in all shapes and sizes, such as chimney stacks, slender petrochemical towers, pipe bridges, manufacturing plant buildings and bulk storage structures. How we work with you will vary depending on the stage of your project. For early design decisions, we leverage our knowledge: Our experienced practitioners can anticipate many wind-related issues. As the design evolves, we refine the strategy with specific investigations. Depending on your needs, we may do wind-tunnel testing of physical models, analysis of computational models, or desk-based assessments. In testing, we may collect hundreds of force, pressure or velocity measurements, as needed. We combine these data with meteorological data on the local wind climate to predict wind-induced responses. Whatever the approach, we work closely with you and your team to ensure that projects proceed seamlessly. With our expertise, we can understand and mitigate any differences in culture, design, climate and risk. We put our conclusions into context for you and your clients. Results are delivered in design-ready, visual, easy-to-share formats. We excel at presenting complicated wind-related issues simply. And if the data show problems, we don’t just report them; we’ll collaborate with you to solve them creatively. When needed, we call on the whole range of our company’s exceptional expertise in areas beyond wind engineering. Always, our goal is to choose the right tools and methods to answer your questions.

Collaboration and communication
Wind engineering requires strong collaboration. Within RWDI, we consult with a cross-section of experts in model construction, physical and computational wind science, structural reliability, structural dynamics, and design and development. We connect our firm’s structural and process engineers as needed. Our results are delivered as design-ready forecasts, analysis and visual formats, because communication is the root of your design team.

Determing wind forces
We operate various boundary-layer wind tunnels, including those that are capable of modeling large structures. Our investigations typically focus on determining the wind forces acting on a structure’s main wind-force resisting system (MWFRS) and secondary structural systems. When codes are conservative—realistic—they are designed to be lost in the data—with an initial cost reduction. Otherwise, we impose limitations that would take up too much space for the extension of the structure to be addressed.

Planning early for motion and vibration
Through early involvement in the design process, we develop designs engineers will want to shape and optimize from the start. Early and accurate aerodynamic data can make or break a project. We can develop guidelines and protocols for operation of structural systems. For example, we can recommend how the openings in a bulk storage facility can be put in a “storm-ready” configuration during a typhoon to reduce wind loads to achieve safety and achieve a more economical structural design.
RWDI’s core practice areas bring together a diverse array of capabilities around a common purpose: meeting the immediate aims and broader business goals of our clients.