Why Conduct Wind Tunnel Testing?

Why Do Wind Tunnel Testing?

Technical, Economic,
Safety & Aesthetic Advantages
Today’s architects and engineers challenge the traditional boundaries of their craft, using high-tech materials and innovative structural design techniques to create buildings and structures as true art expressions. In addition, new structures are being designed for complex situations and surroundings (i.e., near terrain or other structures). Yet, wind loads provided in most codes and standards haven’t kept up. They are based on a range of building shapes that were common over 40 years ago and many codes recognize that wind tunnel tests will lead to more reliable loading estimates that result in savings, peace of mind and maximum creative freedom.

Progressive designers and engineers understand that significant savings in cost of structure and cladding can be obtained by completing a wind tunnel test in the early stage of the design.

Wind Tunnel testing delivers:
- Accurate results to minimize assumptions
- Opportunity for architectural expression
- Construction savings for the owner
- Improve earning potential with maximum floor space
- Assurance – often recommended by code
- Increased litigation protection

When should a Wind Tunnel Test be done?

Early Design Stage
In the early planning stages, careful attention to the effects of wind, snow, ventilation, vibration and related microclimate environmental issues on buildings and structural are proven to save time, save money and reduce risk.

Tall Buildings / Unique Designs
Wind tunnel testing is advisable on buildings higher than 22 stories (10 stories in hurricane areas) or where the building or structure is an unusual shape or construction methodology. Unusual terrain or surrounding structures in the area also make wind tunnel testing an important step to optimize cost efficiencies, generate accurate results to enhance the safety of a project, minimize assumptions and allow for maximum design freedom.

TYPICAL PROJECTS FOR RWDI WIND TUNNEL TESTING
- Skyscrapers and tall buildings
- Groups of buildings
- Long span roofs
- Tunnels
- Industrial and institutional facilities
- Long span pedestrian or automotive bridges
- Sporting stadiums
- Casinos
- Other tall or wind-sensitive structures
The Economic Advantages of RWDI Wind Tunnel Testing
The economic advantages of Wind tunnel testing are best understood by reviewing the results of a few case studies. Results will vary from project to project – in the firm’s vast experience, typically the returns on investment on wind tunnel testing can be significant relative to the total project costs.

CASE STUDY 1 – Harbor Walk Development – Destin, Florida
Estimated Construction Savings using Wind Tunnel Testing

<table>
<thead>
<tr>
<th>Component</th>
<th>Pre-Test</th>
<th>Post-Test</th>
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<tbody>
<tr>
<td>Piles</td>
<td>$352,100</td>
<td>$315,330</td>
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<tr>
<td>Pile Cap Concrete &amp; Rebar</td>
<td>$445,640</td>
<td>$335,280</td>
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<td>Shear Wall Rebar</td>
<td>$392,000</td>
<td>$341,600</td>
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<td>Exterior Wall Studs</td>
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<tr>
<td><strong>Total</strong></td>
<td>$2,409,740</td>
<td>$1,767,210</td>
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Estimated Total Savings $645,530 or 27%

CASE STUDY 2 – Seawind Condominium – Gulf Shores, Alabama
Estimated Construction Savings using Wind Tunnel Testing

<table>
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<th>Component</th>
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<tbody>
<tr>
<td>Piles</td>
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<tr>
<td>Pile Cap Concrete &amp; Rebar</td>
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<td>Shear Wall Rebar</td>
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<td>Exterior Wall Studs</td>
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<td><strong>Total</strong></td>
<td>$1,408,483</td>
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</table>

Estimated Total Savings $370,985 or 26%

RWDI is a well-run company focused on continuous improvement, modern systems and procedures, accountability, and client care that exceeds expectations.

Rely on RWDI for...
- Consultations & Design Reviews
- Design Wind Load Calculations
- Wind Pressure Studies
- High Frequency Pressure Integrations Studies
- High Frequency Force-Balance Studies
- Structural Development Assistance
- Wind-Induced Vibration Studies
- Expert Testimony

Who do I talk to if I need to get a test done?
Please contact one of RWDI’s consultants to discuss your particular needs.