

Environmental wind tunnel system

Purpose:

Wind tunnel experiments are one of the most effective methods for prediction of the diffusive-advective process of air pollutant. This system is designed to precisely simulate profiles of temperature, wind velocity and turbulence as they would exist in the real atmospheric boundary layer by adopting an advanced temperature and wind controlling technique.

Main Applications:

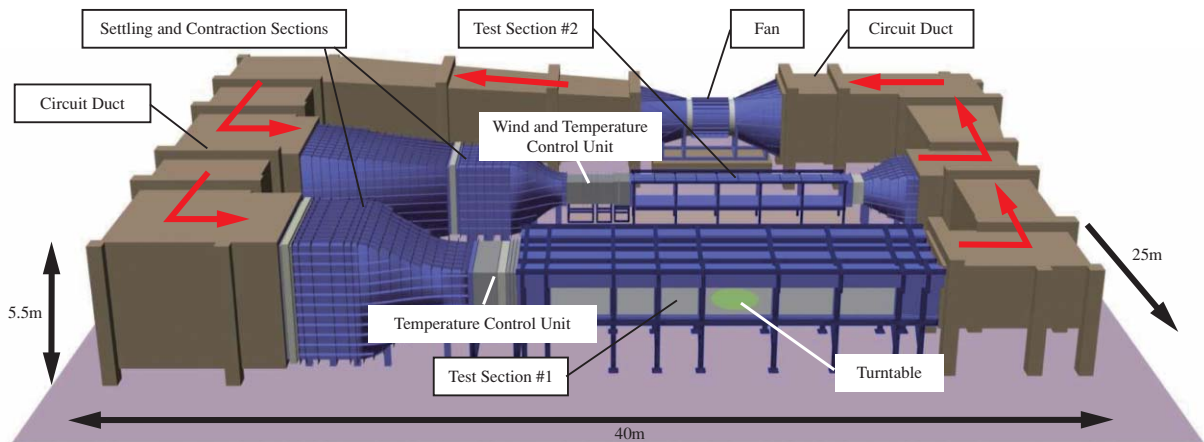
- 1) Flow and air dispersion simulations for a power generation facility (thermal power plant, nuclear power plant)
- 2) Environmental assessment in urban area (effects of distributed generation, urban warming effects)
- 3) Investigation and modeling for turbulent structures and transport mechanisms of heat, mass, and momentum in atmospheric turbulent flow

Specifications:

- 1) Type: horizontal closed-circuit and thermally stratified wind tunnel with two test sections, total dimensions: 40 m (L) × 25 m (W) × 5.5 m (H)
- 2) A wide range of atmospheric thermal stratifications, velocity profiles, and turbulence are precisely reproduced
- 3) Performance characteristics of test section #1
 - Maximum wind velocity: 15 m/s
 - Ambient air temperature: 12 to 100°C (at 1m/s)
 - Instrumentation: Rotatable turntable, traverse system with 6 axes
- 4) Performance characteristics of test section #2
 - Maximum wind velocity: 20 m/s
 - Ambient air temperature: 12 to 100°C (at 2m/s)
 - Instrumentation: Wind control unit, turbulence-generating unit

Location and Date of Installation:

Abiko Campus, August 2005



Schematic diagram of Environmental Wind Tunnel System