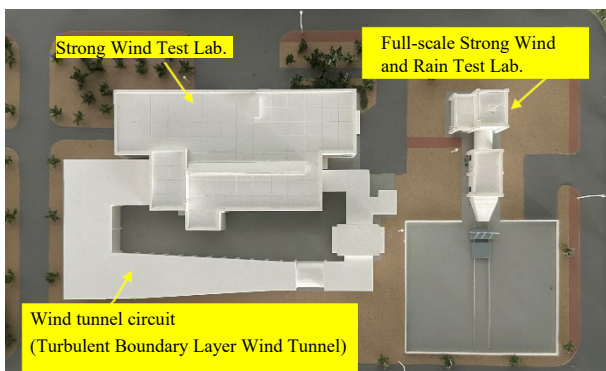


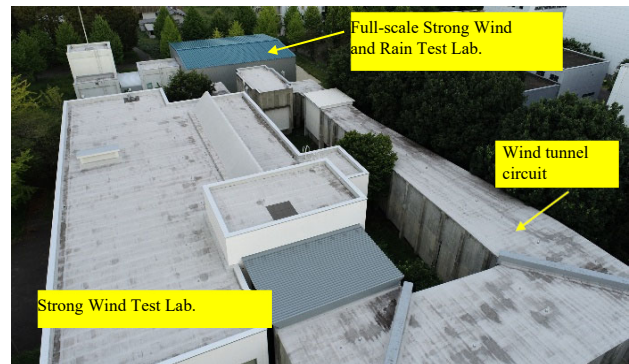
Wind and Rain Test Laboratory

Outline

In order to examine the various impacts of strong winds and heavy rains caused by typhoons and other weather events on buildings, it is essential to conduct research and evaluation through wind tunnel experiments and water spray tests. The Wind and Rain Test Laboratory comprises two laboratories: the Strong Wind Test Laboratory and the Full-scale Strong Wind and Rain Test Laboratory. These facilities are used for conducting experiments for researching the wind resistance of buildings, the waterproof performance of exterior materials, and the urban wind environment.



THE OVERALL MODEL OF WIND AND RAIN TEST LAB.



EXTERIOR SHOT TAKEN WITH A DRONE

Strong Wind Test Laboratory

1. Turbulent Boundary Layer Wind Tunnel (Göttingen Type Wind Tunnel)

The Turbulent Boundary Layer Wind Tunnel is a device used to study wind loads caused by strong winds such as typhoons, wind responses of buildings, and urban wind environments. Depending on the specific research objectives and phenomena, it enables experiments using scale models to study wind pressures, wind forces, aerodynamic vibrations, and flow visualization. It is equipped with an automatic adjustable roughness block to simulate the roughness of urban ground surfaces and can generate various airflows depending on the condition of the ground surface.



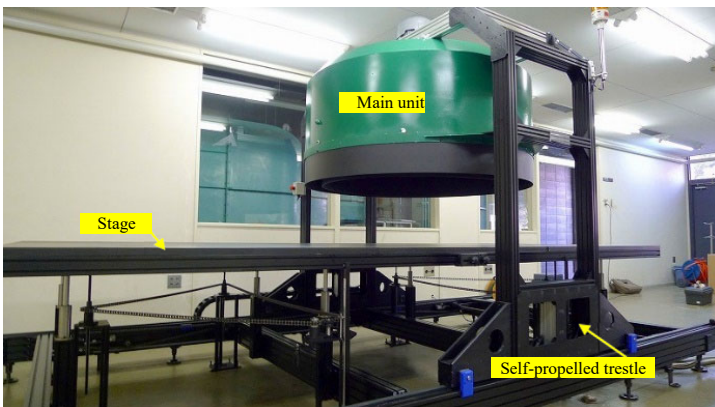
*THE EXTERIOR OF
THE TURBULENT BOUNDARY LAYER WIND TUNNEL.*



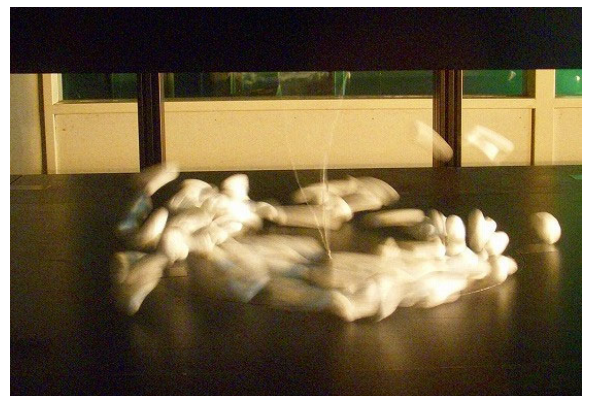
WIND PRESSURE TEST ON A MODEL OF A SKYSCRAPER

2. Tornado-like Wind Simulator

The Tornado-like Wind Simulator is designed to reproduce a non-steady swirling airflow (tornado-like wind) that simulates a moving tornado. It is used to experimentally evaluate the wind force characteristics caused by gusts such as tornadoes and the impact risk due to flying objects. This device consists of a main unit with a built-in blower, a self-propelled trestle, a stage, and a control panel. A scale model is placed on the stage to measure the wind pressure generated by the tornado-shaped airflow as it passes.



APPEARANCE OF TORNADO-LIKE WIND SIMULATOR

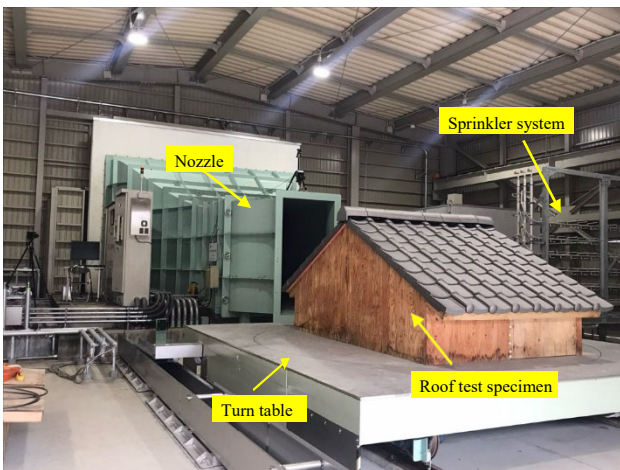


TORNADO-LIKE AIRFLOW

■ Full-scale Strong Wind and Rain Test Laboratory

3. Full-scale Severe Storm Generator

The Full-scale Severe Storm Generator, established in 2020, is a device capable of conducting experiments under wind speeds exceeding 70 m/s at maximum. It is also equipped with a sprinkler system, allowing for experiments under strong wind and rain equivalent to recent powerful typhoons. This device enables waterproof performance tests and wind resistance tests, including the evaluation of potential damage and failure of finishing materials on full-scale buildings, such as roofing, exterior walls, and openings like window glass.



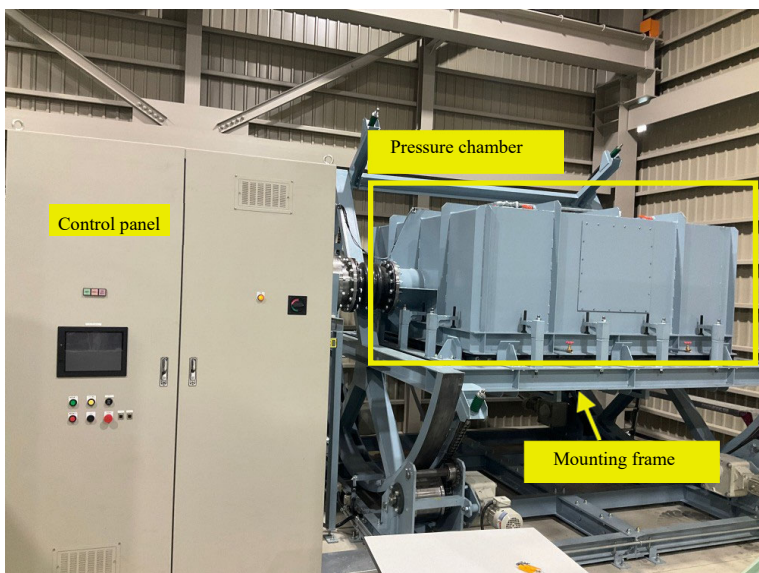
ROOF TILE SCATTERING EXPERIMENT

APPEARANCE OF

FULL-SCALE SEVERE STORM GENERATOR

4. Full-scale Dynamic Wind Pressure Loading Device

The Full-scale Dynamic Wind Pressure Loading Device, established in 2022, is a device designed for testing the wind resistance and waterproof performance of full-scale building materials such as roofing materials, exterior materials, and window sashes. This device is capable of simulating not only static and sinusoidal wind loading but also dynamic wind loading that can fluctuate randomly as actual wind pressure fluctuations.



APPEARANCE OF FULL-SCALE DYNAMIC WIND PRESSURE LOADING DEVICE