Know your Researcher @ Asian Institute of Technology

Edition November 2010 : Dr Pennung Warnitchai


Structural Engineering (STE)

School of Engineering and Technology

STE Faculty

Worsak Kanok-Nukulchai
Professor
Computational Mechanics

Pennung Warnitchai
Associate Professor
Wind& Earthquake Engineering

Adjunct/Affiliated Faculty

Raktipong Sahamitmongkol
Adjunct Instructor

Thanakorn Pheeraphan
Adjunct Assistant Professor

Naveed Anwar
Affiliated Faculty
Associate Director
ACECOMS&HABITECH

Staff

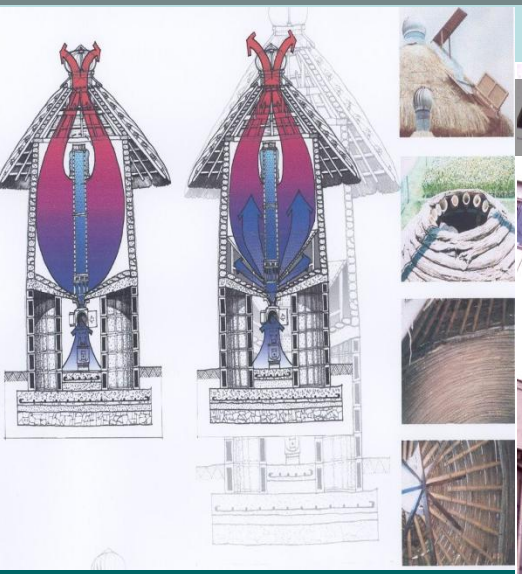
Bussarin N.Nakornjit
STE Field Secretary

Sun Sayamipuk
STE Laboratory Supervisor

Research Focus Areas

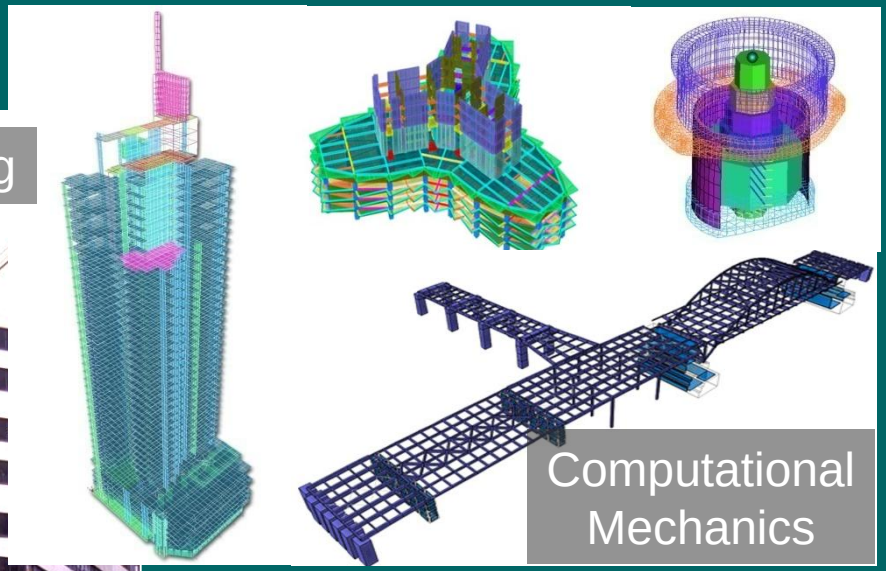
School of Engineering and Technology

Concrete & Construction Materials

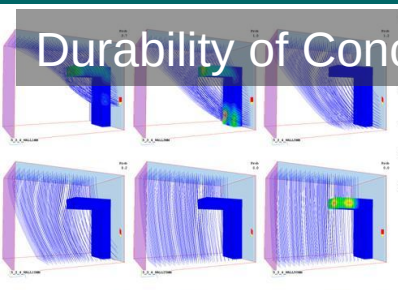


Earthquake Engineering

Computational Mechanics



Durability of Concrete Structures



Wind Effects on Structures

Basic Courses

1. Analysis and Computations
Computer Methods of Structural Analysis
Finite Element Methods in Engineering

2. Dynamics of Structures
Structural Dynamics
Wind and Earthquake Engineering

3. Mechanics of Structures
Continuum Mechanics
Tall Buildings

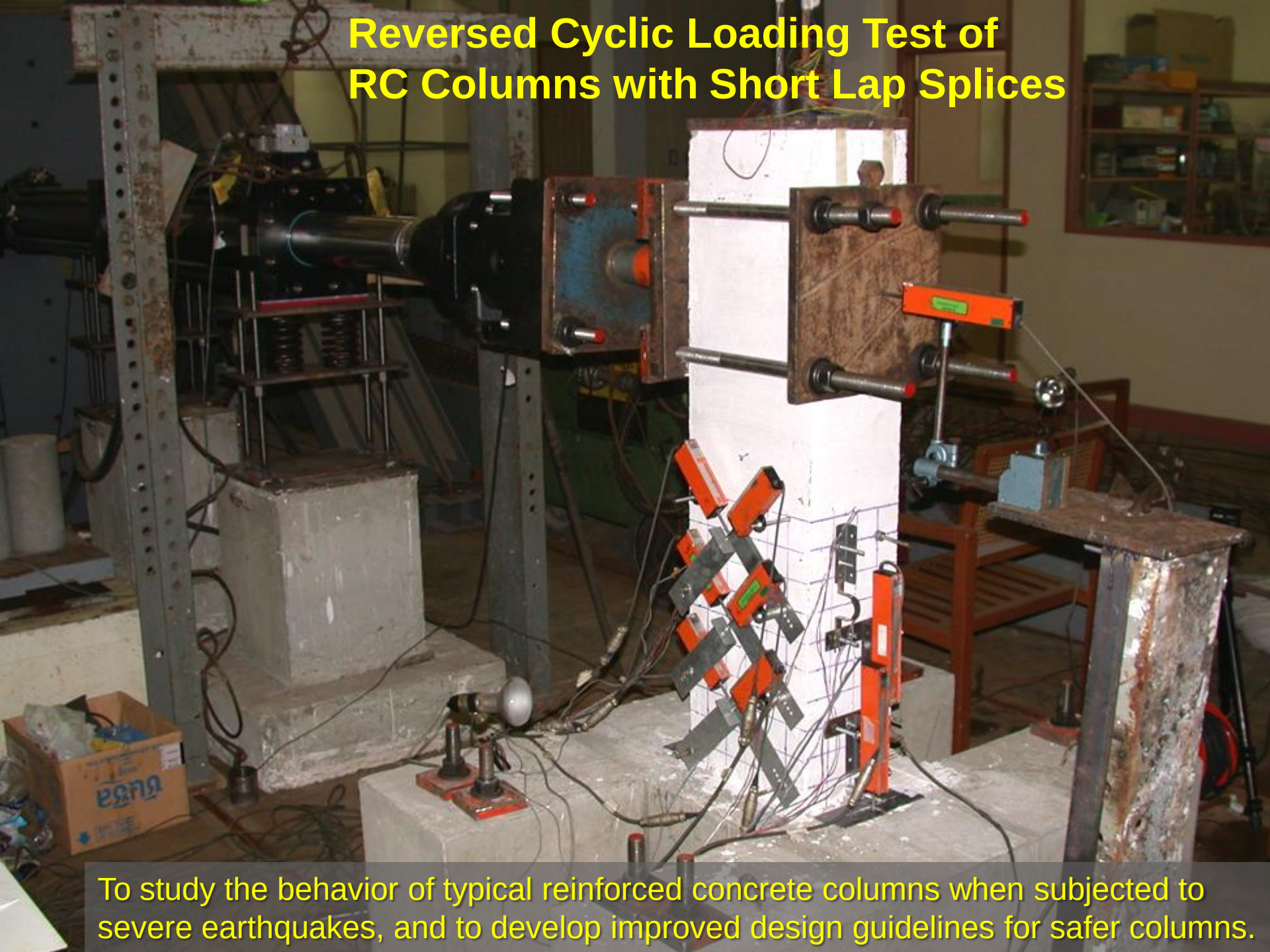
4. Material Technology
Advanced Concrete Technology
Experimental Methods in Structural Engineering

5. Structural Design
Advanced Steel Structures
Advanced Concrete Structures

Structural Engineering Laboratory

Testing facilities at the Lab

Reversed Cyclic Loading Test of RC Columns with Short Lap Splices



To study the behavior of typical reinforced concrete columns when subjected to severe earthquakes, and to develop improved design guidelines for safer columns.

Post-tensioned Flat Slab-Column Frame Building

Buildings of this type are typically designed for gravity loads and wind loads. When subjected to a strong ground shaking, punching shear failure might occur at slab-column connection regions.

Seismic Performance Test of a Slab-Column Connection

Study conducted to investigate the seismic performance of slab-column connections

Development of Seismic Resistant Precast Concrete Structures

Precast concrete structures are normally very vulnerable to earthquake shaking. A new generation of earthquake-resistant precast concrete structures is currently being developed through physical model tests and numerical analysis studies.

TU-AIT Boundary Layer Wind Tunnel Laboratory

The wind tunnel is a state of the art research facility for the study of wind loads and several complex wind-induced effects on buildings and structures.

Some Real life Examples

Involving Dr Pennung Warnitchai & AIT


Wind Tunnel Test on a Bridge Section Model to check its Aerodynamic Stability

The Rach Mieu Cable-stayed Bridge

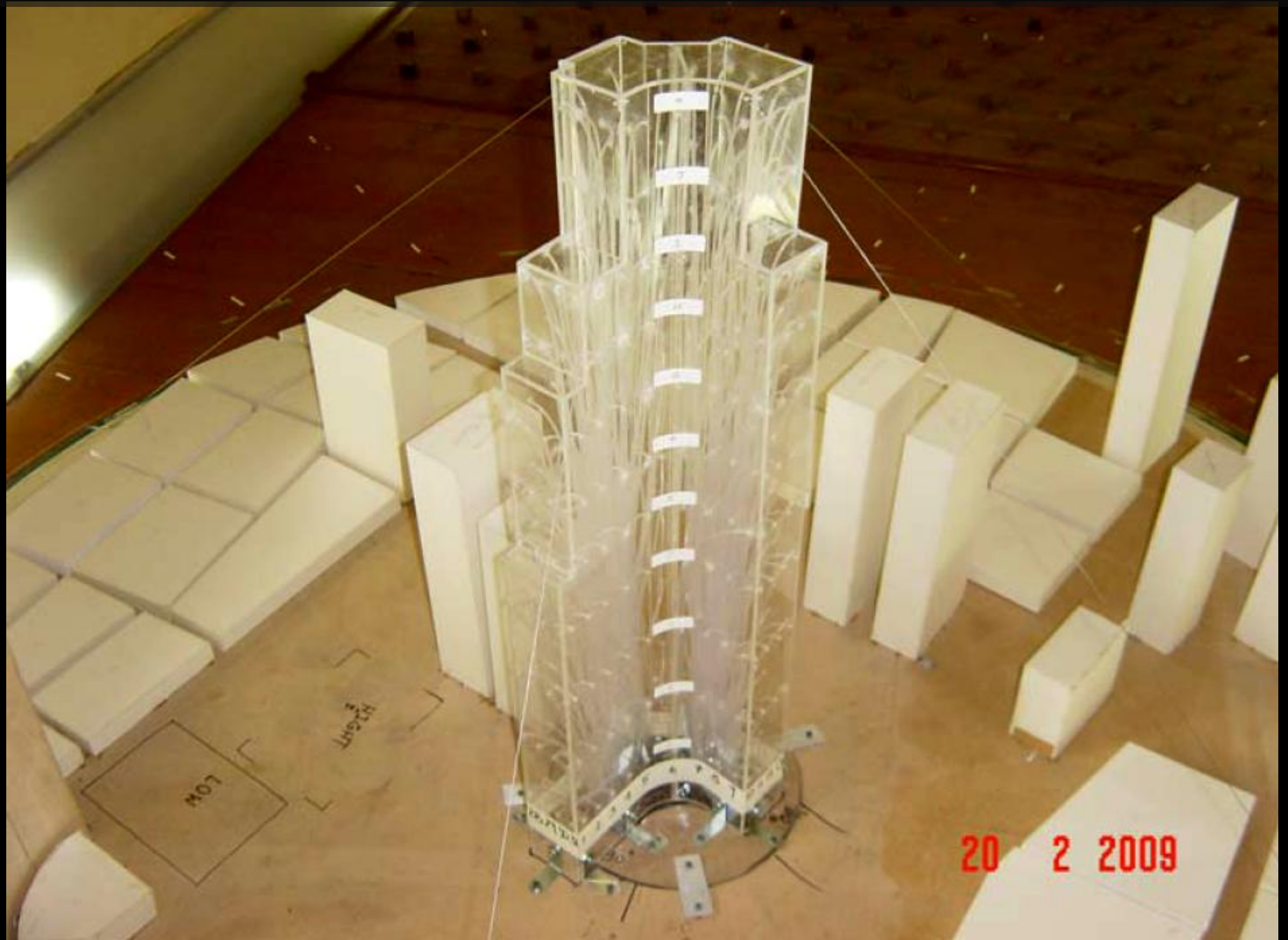
Rach Mieu Bridge is a cable-stayed bridge in the Mekong River Delta, Vietnam. The bridge connects Tien Giang Province (My Tho) with Ben Tre Province, over the Mekong. The Model of this bridge was tested at our facilities.

Dr Pennung's Team did the Wind Tunnel Model Test of The 70-story Gramercy Residence Building

with the presence of all surrounding buildings (Manila, Philippines)

The Gramercy Residences is a high-end residential supertall condominium being constructed in Makati City, Philippines. Upon completion, it will become the Philippines' first supertall building, and will also be the highest.

Model of the Gramercy Residence Building for Wind Pressure Measurement



Mahanakhon: The Tallest Building in Bangkok

MahaNakhon is a planned luxury mixed-use skyscraper to be constructed in the Sathon business area of Bangkok, Thailand .

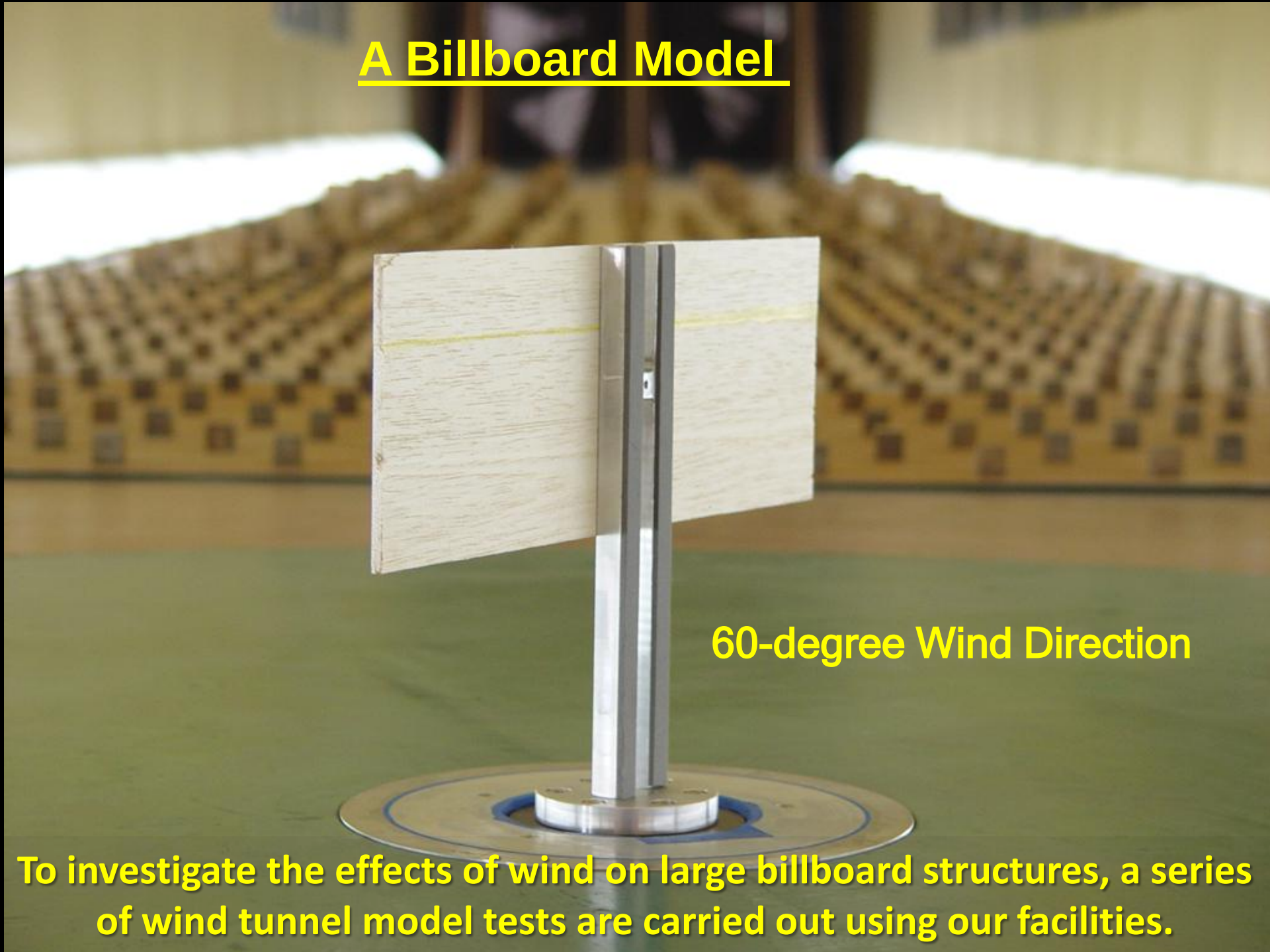
Model of the Mahanakhon Building for Wind Force Measurement

Upon its estimated completion in 2014, it will become the tallest building in Bangkok at 313 metres (1,027 ft) and 77 floors. The building model has been tested at the TU-AIT wind tunnel lab. Dr. Pennung is serving as the principal technical advisor of a structural designer team of this building.

Collapse of a large billboard at Bangna on June 2002

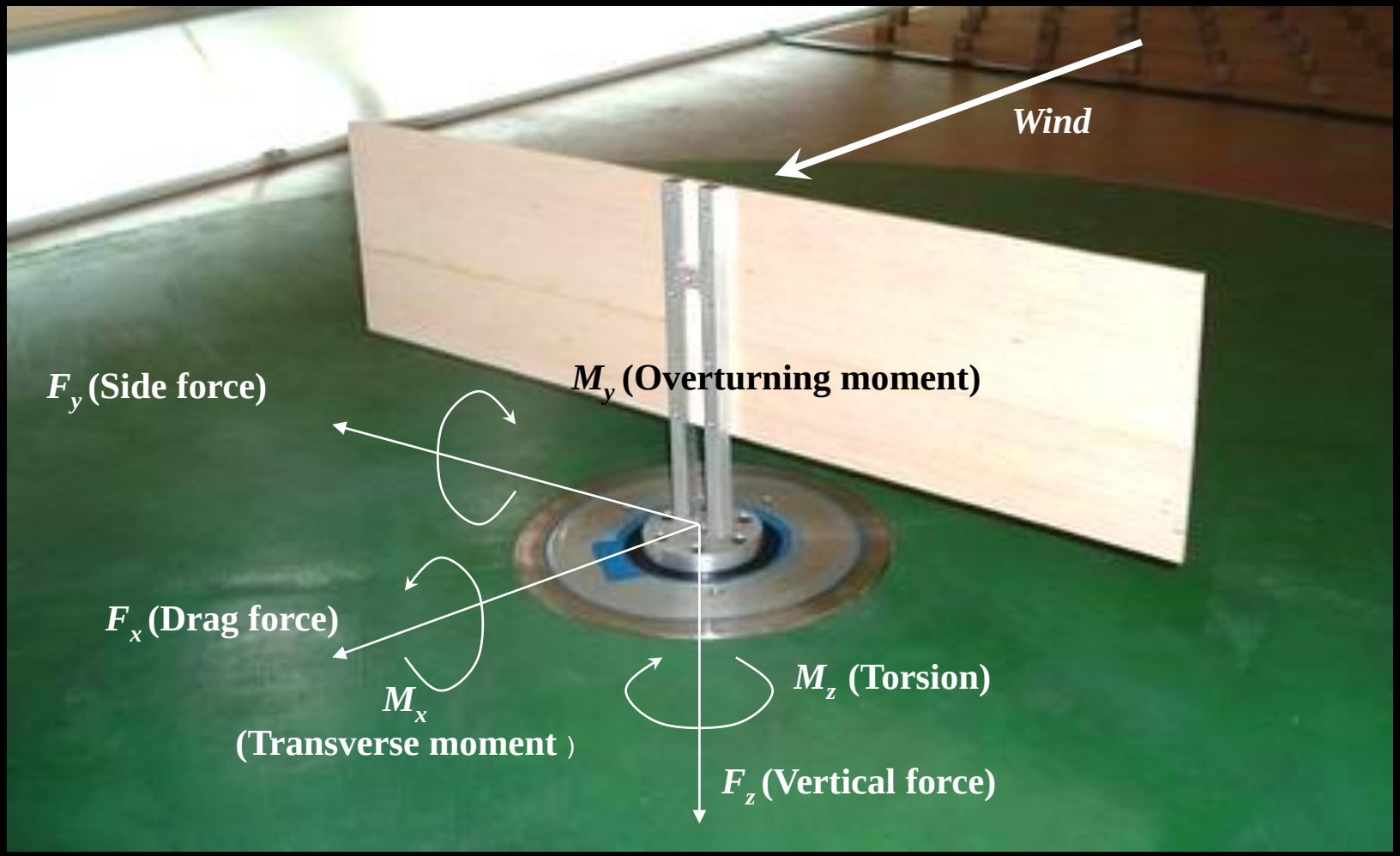
Several large billboards in Bangkok were completely destroyed by severe thunderstorms on 28th June 2007

A Billboard Model

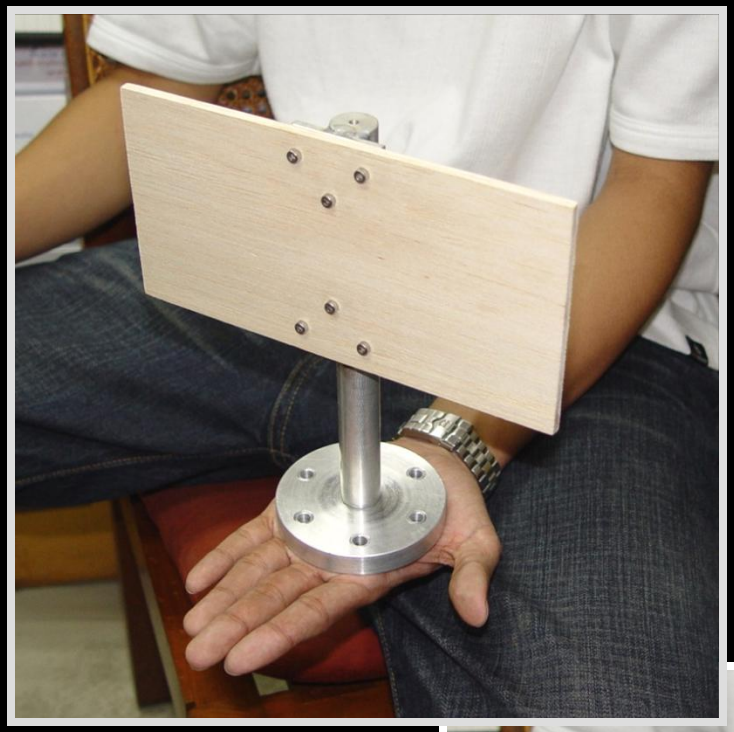


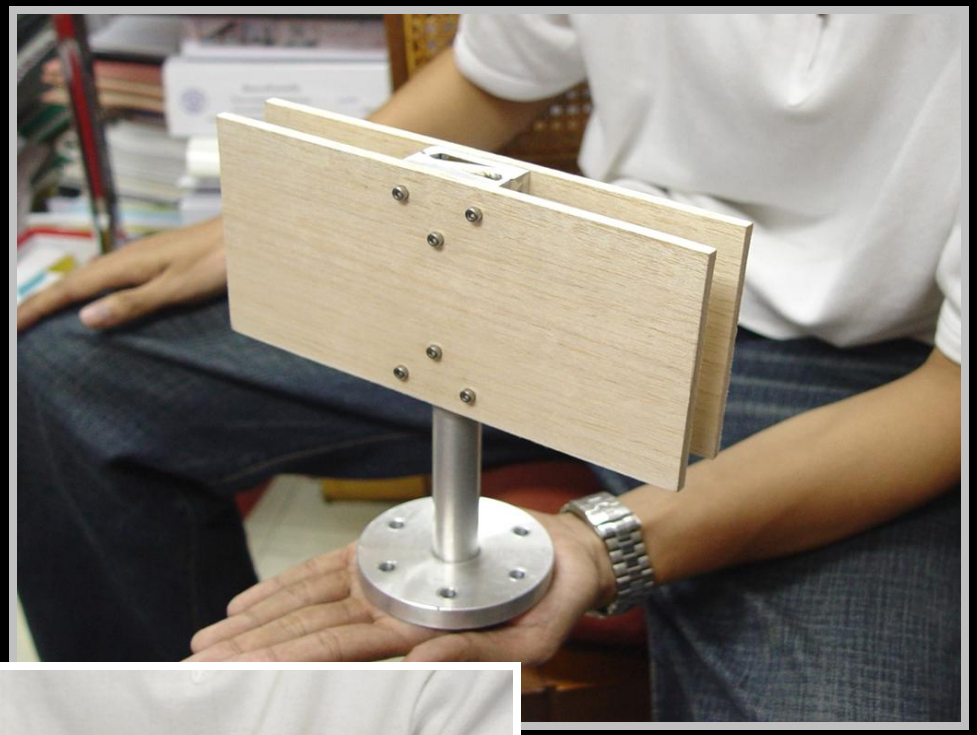
To investigate the effects of wind on large billboard structures, a series of wind tunnel model tests are carried out using our facilities.

A rigid model fixed on the multi-component force sensor



High Frequency Force Balance Technique



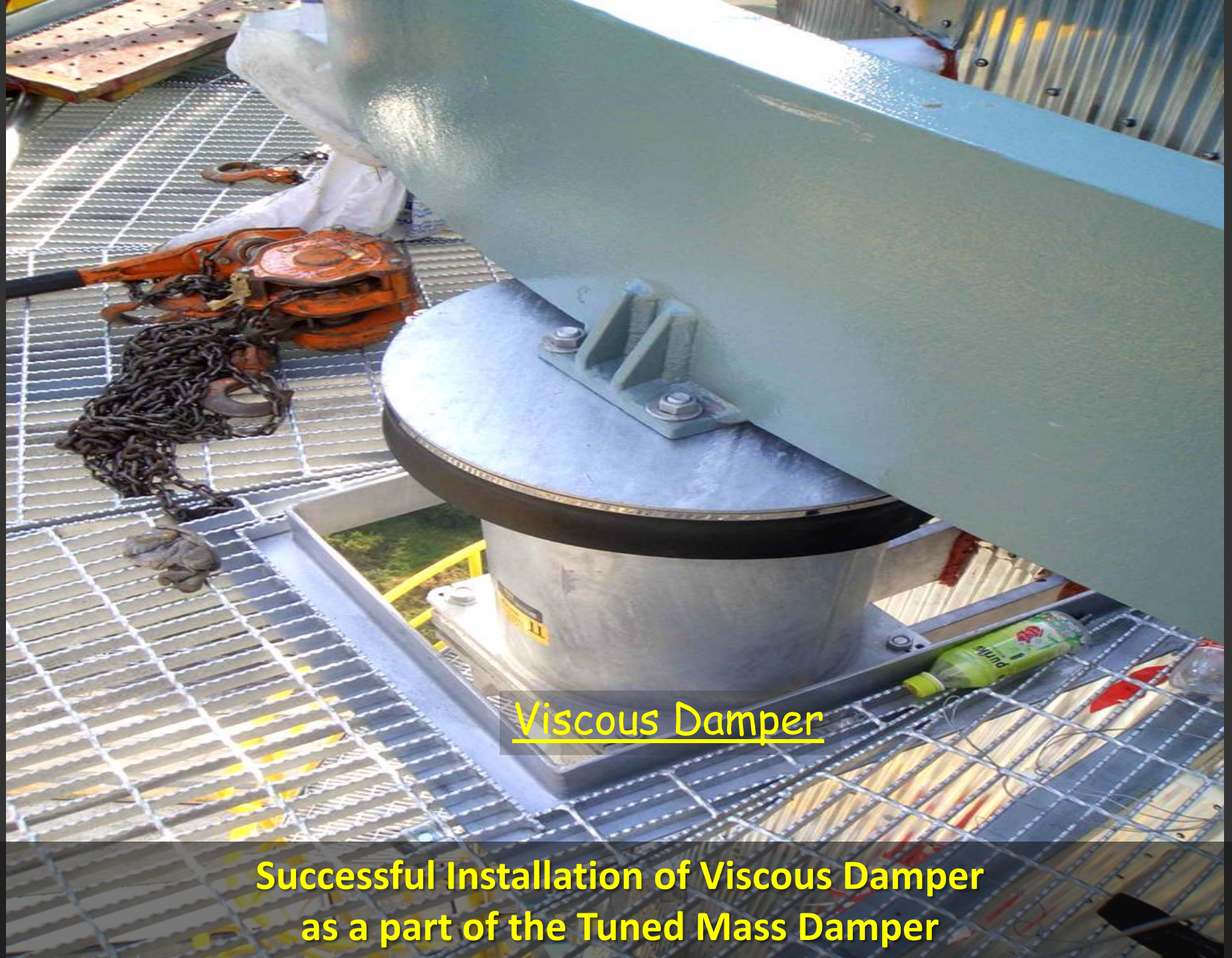


Billboard Models of various configurations considered in the study

Wind-induced Response of the 135-m PTT Stack

Response Suppression by Tuned Mass Dampers

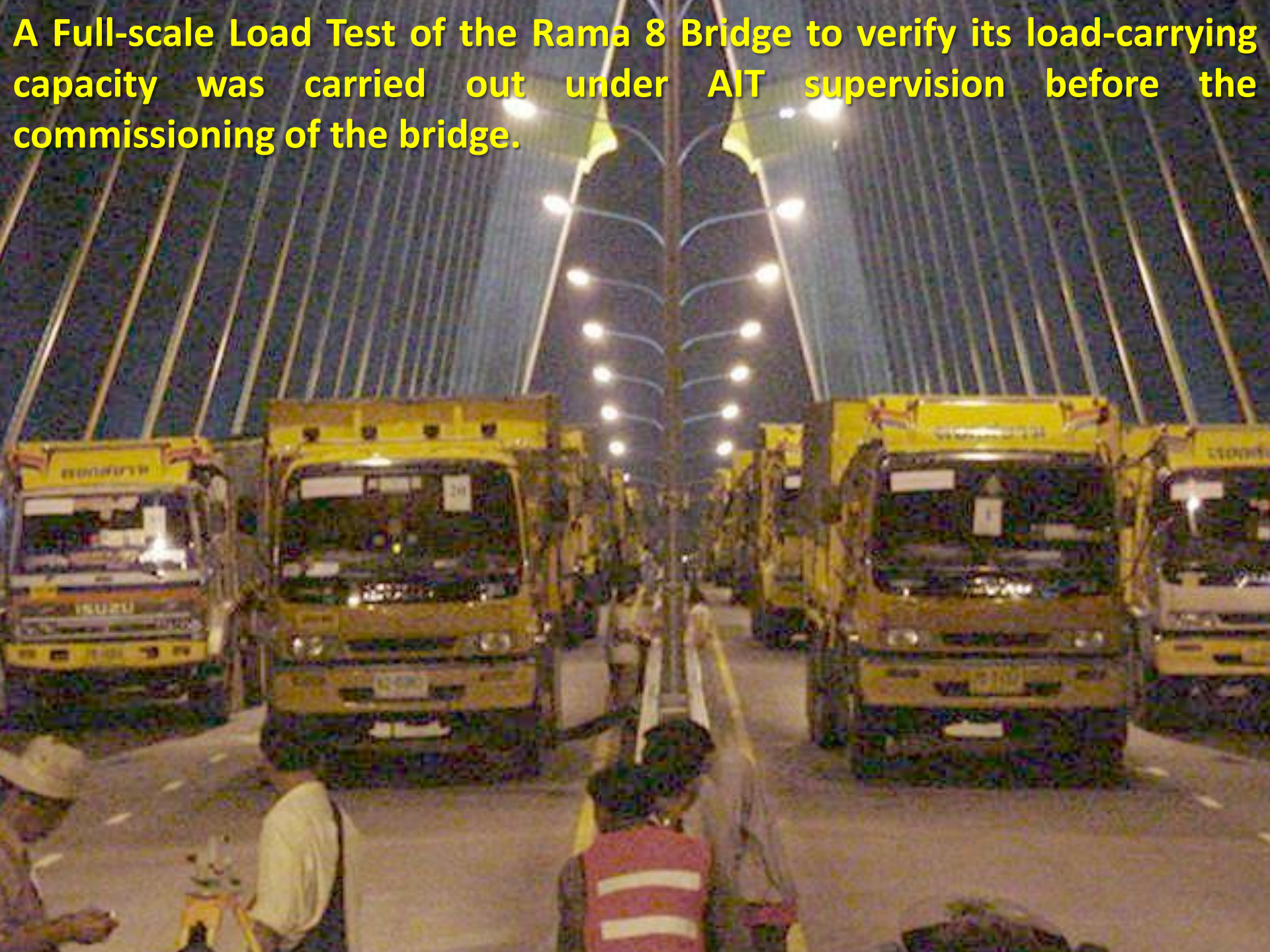
The Installation of a Tuned Mass Damper at the top of the PTT stack to suppress a potentially dangerous wind –induced oscillation. Was tested by our students and staff.



Successful Installation of Viscous Damper as a part of the Tuned Mass Damper

The Rama 8 Cable Stayed Bridge

The bridge in the middle of Bangkok is a prestigious landmark of the Bangkok transport system. It crosses the Chao Phraya River with the tower located on the river bank.


A Full-scale Load Test of the Rama 8 Bridge to verify its load-carrying capacity was carried out under AIT supervision before the commissioning of the bridge.

Thank You

If you would like to highlight your research activities do send in your inputs to

vpresearch@ait.ac.th