ASAI LAB.

How to design buildings resilient against earthquake and tsunami

Department of Fundamental Engineering

Building Resilience for Earthquake and Tsunami
Department of Architecture, Graduate School of Engineering   https://www.iis.u-tokyo.ac.jp/en/research/staff/tatsuya-asai/

Capacity evaluation of buildings against natural hazards

Our laboratory investigates building performance against earthquakes, tsunamis, and other hazards based on experiments, numerical analyses, and field surveys. The main research topics are design tsunami load evaluation based on earthquake damage surveys or big data, performance evaluation and mechanical investigation of building frames or their components based on shaking table tests or static loading tests with high-resolution measurement systems, investigation of seismic behavior of structures based on numerical analysis, and loss assessment of buildings with non-structural components.
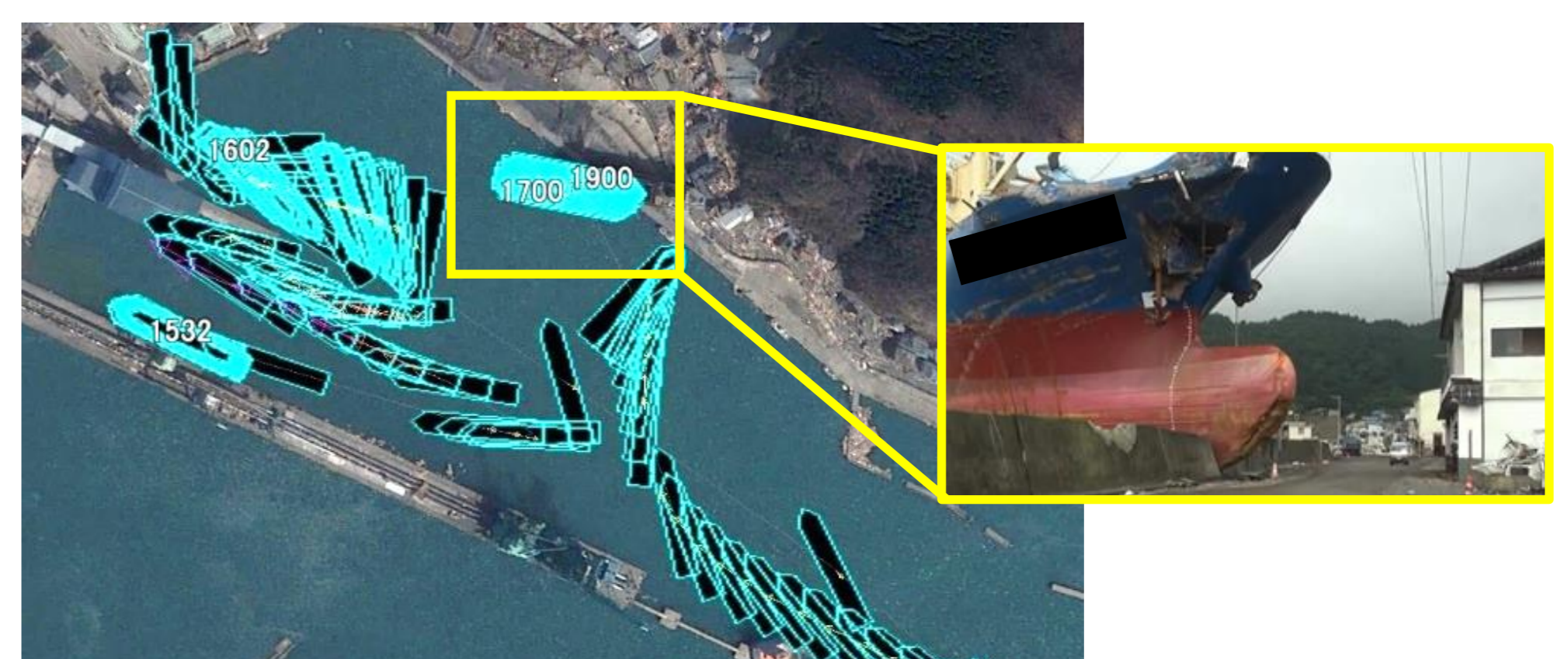
Earthquake Damage Survey

Building and its column collapsed due to earthquake

Building flushed away due to tsunami

Investigation based on big data
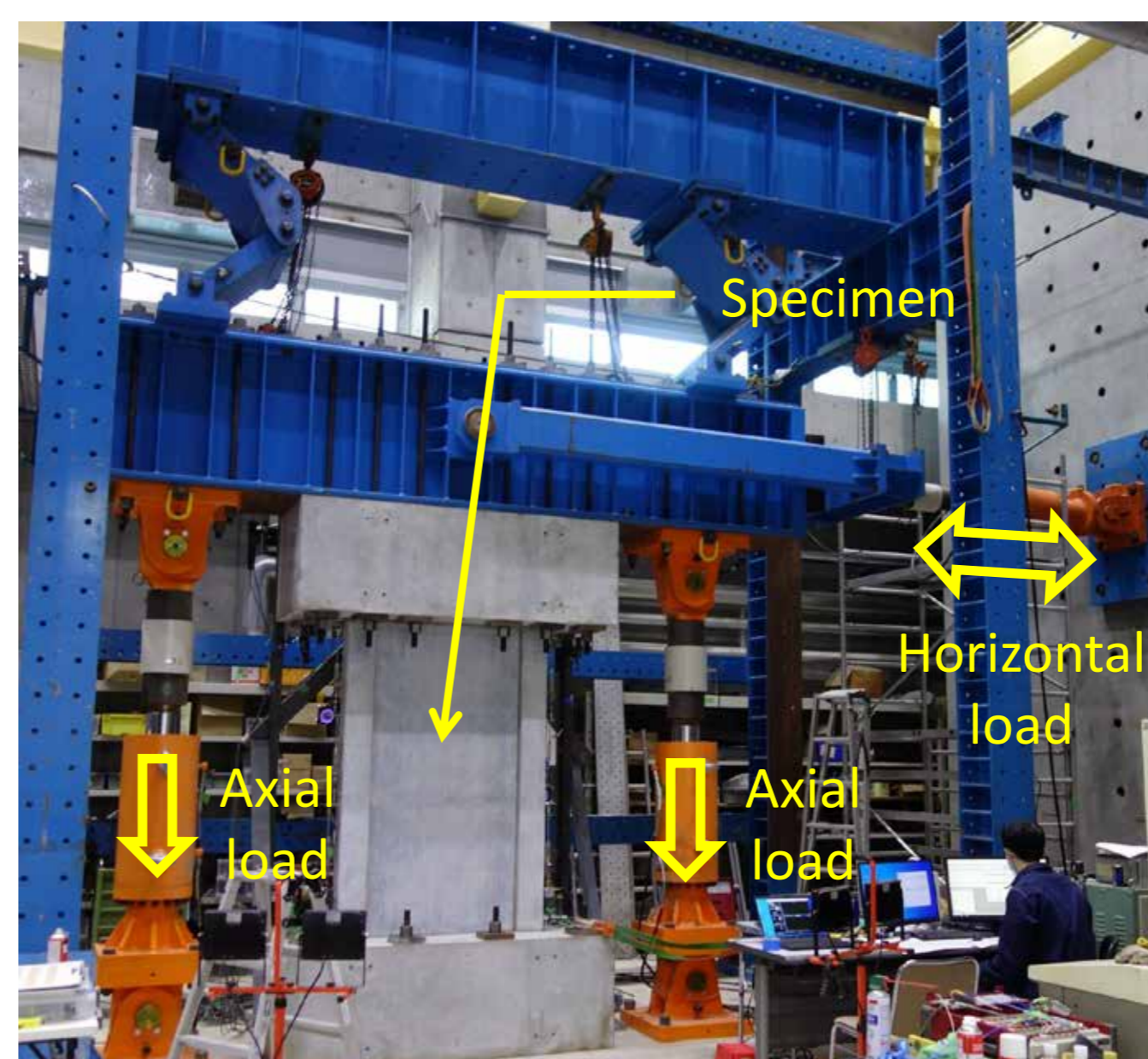

Track of tsunami-driven ship
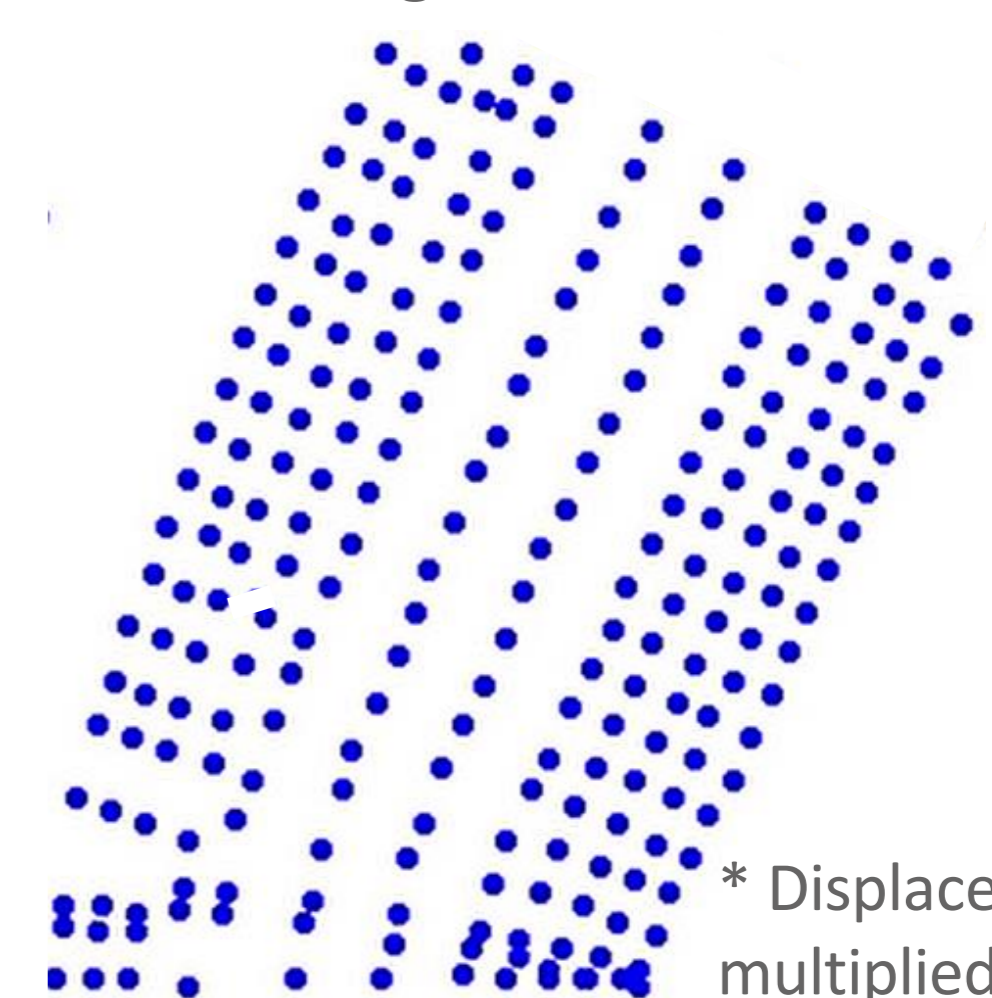
Full-scale shaking table test

5-story RC in 2020

10-story steel in 2023

Loading test of structural component

Specimen

Horizontal load

Axial load

Axial load

High-resolution measurement using infrared camera

* Displacement multiplied by 50

Cyclic loading test of seismic wall

Institute of Industrial Science, The University of Tokyo