

## **2<sup>nd</sup> INTERNATIONAL WORKSHOP ON COASTAL DISASTER PREVENTION**

The Second International Workshop on Coastal Disaster Prevention was held during 18 – 19 January 2006 in Tokyo, Japan. Topics included discussions on storm surge and tsunamis, due to the extensive damage in the Gulf Coast in the US caused by Hurricane Katrina in August 2005. Twenty-eight speakers from Japan, the US, and Indonesia, Mexico, Sri Lanka, Thailand, and Turkey presented comprehensive reports on damages due to the Indian Ocean Tsunami and Hurricane Katrina and their rehabilitation efforts, and state-of-the-art technologies for disaster prevention and mitigation against tsunamis and storm surges.

In the Workshop's panel discussion the integrated measures for coastal disaster mitigation were discussed and the following resolution was summarized: We will need to predict and understand disasters realistically and prepare against disasters with the combined efforts of the public and policy makers. We will need to develop holistic coastal disaster prevention and mitigation measures using integrated technology with international cooperation.

The workshop was organized by the Port and Airport Research Institute, Coastal Development Institute of Technology, Japanese Section of International Navigation Association and Asian Civil Engineering Coordinating Council under the auspices of the Ministry of Land, Infrastructure and Transport, Japan, and the UJNR Panel on Wind and Seismic Effects.

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Photo 1. Plenary Session - Second International Workshop

## **E-DEFENSE EARTHQUAKE MITIGATION IN URBAN AREAS**

For five years beginning in 2002, the National Research Institute for Earth Science and Disaster Prevention (NIED) has conducted research in, “Special Project for Earthquake Disaster Mitigation in Urban Areas (Dai-Dai-Toku)”. During October and November 2005 a series of collapse tests of wood houses using NIED’s Three-Dimensional Full-Scale Earthquake Testing Facility (E-Defense) were conducted including tests to investigate the seismic performance of “Base Isolated and Recovered Present Style Houses”, “Traditional Wood Houses”, and “Retrofitted and Non-retrofitted Conventional Wood Houses”.

In the test of “Retrofitted and Non-retrofitted Conventional Wood Houses”, two typical houses, which existed in Kobe city, were moved and reconstructed on NIED’s shake table. The two houses were originally constructed in 1974 and designed according to Japan’s seismic design code of the early 1970s. One of the houses used in the experiment was ‘as-built’; the other was retrofitted by using general retrofit methods that included adding structure boards, metal joints, and braces.

The two houses were excited simultaneously with severe earthquake ground motion of the JR Takatori Station record which was obtained from the 1995 Hyogo-ken Nanbu (Kobe) Earthquake. As shown in Photo 2 below, the retrofitted house well resisted the severe E-defense motion. However, the ‘as-built’ house collapsed.

At the same time, NIED performed computer simulations of structural performance of the houses. The figure below shows the predicted failure modes of two houses. Good agreement was obtained between the experiment and the simulation and the actual damage during the Kobe Earthquake.

The research was conducted by NIED; Building Research Institute; National Institute for Land, Infrastructure, and Management; Fire Research Institute; University of Tokyo; Kyoto University; Shinshu University; Tokyo Denki University; and Nihon System Design.

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Photo 2. Shake Table Test by E-Defense (Left: Retrofitted, Right: ‘As-built’)

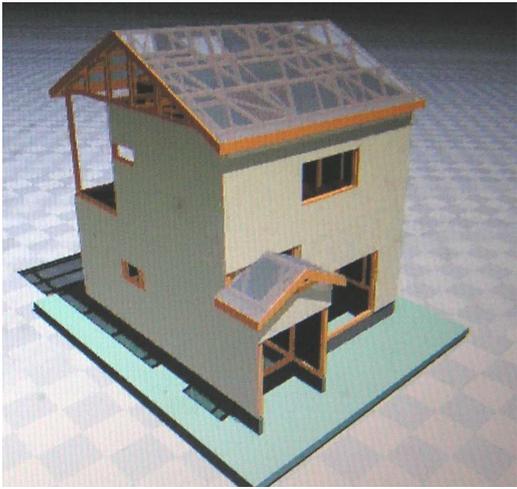


Figure. Computer Prediction of the E-Defense Test (Left: Retrofitted, Right: 'As-built')