

21ST BRIDGE ENGINEERING WORKSHOP

The Panel's Task Committee G on Transportation System hosted its 21st US-Japan Bridge Engineering Workshop during 3-5 October 2005 at the Public Works Research Institute (PWRI), Tsukuba, Japan. This two and half days Workshop focused on: 1) Advancing Seismic Engineering, 2) Geotechnical Technology, and 3) Bridge Management System. Twenty participants from the US and 70 participants from Japan attended the workshop where 45 papers were presented on bridge engineering. The workshop closed with the Resolutions that the 22nd Workshop will be held in the US in the fall of 2006. Specific dates, location and themes of the next workshop will be finalized in May 2006 during the Panel's 38th annual Joint Panel Meeting.

Following the Workshop, the US participants and members of Japan side's Task Committee participated in three-days of technical site visits in the greater Kobe, Osaka, and Kyodo city area. Visits included the National Research Institute for Earth Science and Disaster Prevention's (NIED) 3-D Full-Scale Earthquake Testing Facility (E-Defense) at the Hyogo Earthquake Engineering Research Center in Miki City, the Akashi-Kaikyo Suspension Bridge (world's longest bridge), seismic retrofit of the Minato Bridge in Osaka, and a new tunnel construction site of the Hanshin Expressway Public Corporations.

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Group photo of delegation at the long-span Minato cantilever truss bridge, Osaka.

BRI STARTED MULTI-PURPOSE EXPERIMENTS USING FULL-SCALE FOUR-STORY WOOD FRAME BUILDING

Since 2005, four-story wood buildings are being constructed in Japan. These four-story buildings require high seismic safety, fire safety, and related performance standards. To investigate and verify building performance, BRI began conducting multi-purpose experiments in November 2005 using a full-scale four-story wood frame building (see photo). Research includes:

- dynamic performance of structures (natural frequency, damping factor),
- structural vibration by traffic, wind, and earthquakes,
- structural effect of tie-down system,
- structural effect of gypsum boards and sidings,
- shrinkage of height of structures during and after construction,
- performance of sound insulation between floors and walls,
- effect of passive sound insulator for floors,
- effect of response reducer for traffic vibration (passive and active).



Full-scale wood frame building during construction

Preliminary results on shrinkage during construction revealed more than 4mm shrinkage in the wood frames was observed from contraction of wood (shrinkage). Reduction in the height of structures between each story and foundation were measured during and after construction. Figure 1 shows a time domain vertical displacement at the fourth floor.



Figure 1. Shrinkage -Time domain curves at the fourth floor

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