UJNR Panel on Wind and Seismic Effects

Panel Update

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Development of Rational Design Method for Reinforced Concrete Rock Shed Structures

Rock-shed structures are widely used in Japan to protect highways from rock fall disasters, see photograph 1. For example, in the Hokkaido district, recent serious rock fall disasters have occurred along highways. Hokkaido and other locations in Japan are experiencing construction of new highways and maintenance of highways along cliff areas where rock sheds will be constructed. The Civil Engineering Research Institute for Cold Region, PWRI (located in Hokkaido), is conducting research to develop the limit state design method of rock sheds.

Photograph 2 shows a full scale impact test to determine the behavior of rock shed caused by impact load of rock fall. In a series of tests, a heavy weight was dropped on the reinforced concrete beam to model the upper slab of rock shed structures. Moreover, the Institute conducts dynamic numerical analysis using three-dimensional elasto-plastic Finite Element Method. Figure 1 shows an example of the simulation analysis of the beam behavior.

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Photograph 1. Reinforced Concrete Rock Shed

Photograph 2. Weight Drop Tests on RC Beam

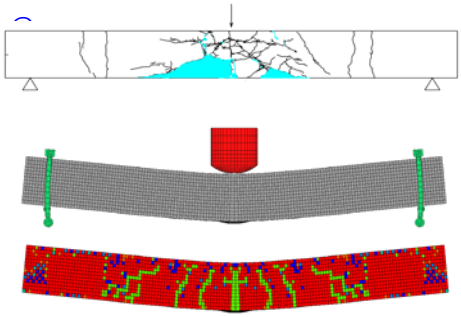

Figure 1. Example of Numerical Analysis

TASK COMMITTEE B
SEEKING PARTNERS IN SHAPING ITS VISION

Task Committee B, Next-Generation Building and Infrastructure Systems is developing its vision to conduct joint bilateral research candidate topics performed as a Task Committee and through clustering with other Panel Task Committees (TC) and public/private sector collaborators. Panel TCs include Transportation Systems and Fire Performance of Structures and the Panel's focus on Geospatial Engineering and Public Health Following Natural Disasters. The Task Committee is framing a bilateral workshop planned for late 2006 or early 2007 where it will identify specific cooperative research topics and cooperative mechanism in two focus areas:

1. High-Performance Buildings
    - Performance-based design methodology
    - Advanced materials and Smart structure technologies
    - Multi-hazard resistance design to include fire, indoor air quality and other hazard loadings in addition to earthquake and wind
2. High-Performance Infrastructure System
    - Health monitoring and response control of bridges
    - System performance of transportation network (and other lifeline systems)
    - Multiple-hazard resistant design methodologies

The vision and Workshop planning will be held during the 38th Joint Meeting of the Panel on Wind and Seismic Effects. There is great potential in coordinating Panel's work through clustering with other Panel Task Committees and with government agencies and the private sector as a way to leverage the ever scarce human and financial resources. As was pointed out in *Panel Update*, V 3, N^{o} 3, October 2005 "The potential for Panel leadership in fostering effective collaborative activities should be leveraged to obtain support from other government agencies. While collaborations can occur without the Panel's intervention, this structure offers the strategic infrastructure which – if properly exercised – can lead to otherwise unrealizable efficiencies."

We welcome your comments.

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