



CIB NEWS ARTICLE

International Council for Research and Innovation
in Building and Construction

Providing a global network for international exchange and cooperation in research and innovation in building and construction, in support of an improved building process and of improved performance of the built environment.

February 2009

Around the Task Groups and Working Commissions

W114 - Earthquake Engineering and Buildings



Report from: Two International Workshops on Response Control and Seismic Isolation of Buildings for Earthquake Disaster Mitigation

First Workshop

After its 1st meeting in Guangzhou, China in November 2006, CIB W114 organised "The International Workshop on Response Control and Seismic Isolation of Buildings," in November 2008. More than forty scholars from China and Japan participated to exchange information on the latest developments of isolating system.

Participants of the Workshop agreed to conclude an action plan as stated below to conduct collaborative research and development activities on the research of response control and seismic isolation techniques for buildings and structures.

- development of international structural design guidelines for structural design, construction, device and testing, maintenance, of response controlled and seismically isolated buildings, harmonizing existing guidelines such as ISO22762,
- comparison of existing structural design codes of seismically isolated buildings in different countries using a benchmark building,
- development of performance based structural design method including cost evaluation such as evaluation of life-cycle cost, direct and indirect cost,
- researches on new material and new devices to improve seismic performance of response controlled and seismically isolated buildings,



- development of low-cost devices in order to apply response control and seismic isolation techniques to rural area and developing countries,
- exchange of personnel such as researcher and engineers to promote research and development of response control and seismic isolation techniques for buildings,
- exploring possibilities for the shaking table test to verify the ultimate behavior of seismically isolated building,
- exploring possibilities to develop a compression test machine for large size isolators,
- organizing workshops and other events to share experiences, research outputs,
- development of dissemination and education tools to popularize response control and seismic isolation techniques for buildings,
- launch of W114 web site to exchange technical information, reports and publications,
- development of information database on the W114 web site collecting building codes, building applications and devices from countries worldwide.

Second Workshop

Responding to the recent earthquake disasters in China and Japan; the Great Sichuan earthquake in China on May 12 and the Miyagi-Iwate Inland earthquake in Japan on June 14, the W114 (Earthquake Engineering and Buildings) organized a second "International Workshop on Response Control and Seismic Isolation of Buildings for Earthquake Disaster Mitigation" in Nanjing, China during November 18-19, 2008 to exchange information on the application of seismic isolation and response control techniques for buildings and discuss how to promote and disseminate the techniques worldwide as the promising techniques for earthquake safety of buildings.

The work programme focussed on the following topics related to earthquake engineering and buildings.

- Current situation of response control and seismically isolated buildings
- Recent Applications of the seismically isolated structure
- Response control system of Shanghai World Financial Center
- Oil-damper
- Base isolation system for high-rise buildings
- Seismic Isolation and response control applications
- Research and application of structural control techniques
- Structural control techniques used in engineering problems
- Performance of isolated building under real earthquake

Isolated design

Participants of the Workshop agreed to conduct further activities on the following subjects of response control and seismic isolation techniques for buildings and structures.

- Research on the cost and benefit
 - Study on life cycle cost of response controlled and seismically isolated buildings to explain the benefit to the owners.
 - Preparation of the menu with different levels of structural performance to the owners, including response control and seismic isolation system as the means to achieve better performance.
- Research on high-rise buildings with base isolation system
 - Study on the effect of the long-period component of input earthquake ground motion.
 - Study on the wind load effect to the residual displacement at the isolated floor.
 - Study on the limitation of natural period and aspect ratio of the superstructure to adopt base isolation system for high-rise buildings.
- Research on vertical response of structure
 - Study of the mechanism of vertical response of seismically isolated buildings.
 - Development of design procedure for the foundation of base isolation system considering vertical input ground motions.
 - Development of inexpensive and effective 3D isolators to reduce both horizontal and vertical responses and design details for device anchorage.
- Research on regulation / certification procedure
 - Development of a simple and performance-based design procedure that could be adopted by different countries at will.
- Dissemination and education activities
 - Exploring the possibility to gather funds to make videos, toys, brochures, etc.
 - Conducting shaking table tests of response controlled and seismically controlled buildings comparing the performance with ordinary buildings.
 - Conducting dissemination activities involving design institutions and construction companies.
- International cooperation
 - Conducting the benchmark code study and creating database of buildings and devices such as proposed by W114.
- Lessons by the disaster of the Wenchuan Earthquake on May 12, 2008,
 - Urgently promoting seismically isolated buildings to protect human lives and property in the buildings.
 - Posting an informative notice near the building to indicate the base-isolation system,

which will prevent mistakes in construction and maintenance.

Next Meetings

There are two meeting scheduled:

2009: 16-18 September, in conjunction with the JSSI 15th Anniversary Workshop in Tokyo, Japan

2009: 17-21 November, in conjunction with the 11th World Conference on Seismic Isolation, Energy Dissipation and Active Vibration Control of Structures, Guangzhou, China

Additional Information

For additional information about the CIB W114 meetings please contact the Coordinator: Taiki Saito
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You can find more information on the activities of CIB W114 at www.cibworld.nl - Databases - select "Go to Database" - in the shown search engine: type W114 in the field "Commission number".