Tecnology

Posted by: Anonimi
Posted on : 2007/10/26 17:20:00

Veronica Rocco

On the 23rd of October 2007 international researchers, politicians and entrepreneurs coming from United States, Canada, Korea, India and New Zealand were all gathered in Miki, a small Japanese town that houses the National Research Institute of Earth Science and Disaster Prevention, the most important anti-seismic laboratory, where a seven-storey building – 23.5 meters of height – survived Kobe's earthquake simulation. For the first time since 1995, when a devastating earthquake, known as "Great Haushin-Awaji", shaked an entire village in Kobe and caused nearly six thousand victims, a wooden structure successfully survived such a blast.

Yoshimitsu Okada, one of the leading ant-seismic experts, applauded Italy's project, called "SOFIE", claiming that it is an innovation destined to change worldwide building techniques.
SOFIE is the result of a five-year research run by IVALSA (Trees and Timber Institute) of Italy's National Research Council (CNR).
A really innovative system, if we take into account the fact that international laws intedict to raise wooden buildings with more than 7.5 meters of height on seismic areas.
The recent earthquake that hit Japan, causing nine victims and one thousand injured people, destroyed countless old wooden buildings. In the aftermath of this disaster, the general conclusion was that timber is not a reliable material for building on seimic areas because it is not sufficiently resistant to fire blast or earthquake .
As highlighted by Maria Giovanna Franch (1), wood is a highly suitable material in the building sector due to its main features: lightness and durability.
The SOFIE project, by enhancing these features, developed a highly sophisticated building technique that combines state-of-the-art materials with mechanical connections. This technology results in cross-laminated timber panels with a thickness from five to thirty centimeters according to the X-lam system. The wooden walls are covered with non-combustible insulation material.
This project – originally developed in Germany but brought to perfection in Italy – shows the reliability and safety of wood in comparison with commonly used materials such as concrete.
In July 2006 IVALSA – in partnership with the National Institute for Earth Science (NIED), the Building Research Institute, Shizuoka University and Japan's Centre for Better Living – tested a three-storey prototype of SOFIE, that survived a series of 15 large earthquakes.
In March 2007 this prototype was at the center of another testing programme that took place in Japan: fire resistance. Wood – as outlined by Giovanna Maria Franch (2) – is widely regarded as being scarcely resistant to fire blast. This is one of the main difficulties in using wood in the building sector.
The experiment carried out in march 2007 involved a 3-storey Sofie building and simulated a real blast inside a hotel room. The building structure was designed to survive a one hour blast and to guarantee occupants' integrity. When the fire was finally extinguished, after nearly 60 minutes from its outburst, the building maintained its structural integrity.
Sofie project finally contributes to dispel the widespread opinion that wood does not guarantee an

adequate level of security.
Entirely run by an Italian team of engineers and researchers, SOFIE is a state of the art combination of technological innovation and environmental sustainability, in so far as it encompasses a wide range of aspects in building design: acoustics, energy saving, durability under severe hygrothermal conditions.

Veronica Rocco

(1)* Maria Giovanna Franch (CNR-IVALSA) "Apologia della casa di legno, il progetto SOFIE e i terremoti", www.scienzaonline.com Anno 4, 18/07/2007.

(2)* Maria Giovanna Franch, Giovanna Bochicchio (CNR-IVALSA) "Progetto Sofie: la casa di legno del Trentino è a prova di fuoco", www.scienzaonline.com Anno 4, 30/03/2007.