

RECENT RESEARCH ACTIVITIES

Development of Wooden Eco House Utilizing Natural Building Materials

Kohei Komatsu, Shinjiro Takino, Takuro Mori and Yasuo Kataoka*

(Laboratory of Structural Function, RISH, Kyoto University; *at present Cyubu University)

Shuichi Kawai, Masafumi Inoue** and Kenji Umemura

(Laboratory of Sustainable Materials, RISH, Kyoto University; **at present Tokyo University)

Yuji Imamura, Kunio Tsuchida, Tsuyoshi Yoshimura and Toshimitsu Hata

(Laboratory of Innovative Humano-habitability, RISH, Kyoto University)

Hiroyuki Yano, Toshiro Morooka

(Laboratory of Active Bio-based Materials, RISH, Kyoto University)

A two story experimental wooden house of 5.4m x 9.1m plane dimensions was completed in November 2006 as shown in Fig.1. This wooden construction is a result of our 6-year collective research activities for developing an idealized wooden structure which has minimum loads on the environment, and is composed of sustainable natural materials such as wood, mud and bamboo etc.

Square timbers of 15cm x 15cm cross section sawn from 60 years old Sugi (Japanese Cedar, *Cryptomeria japonica*) logs were used for the continuous columns and sills. For short columns, 12cm x 12cm square sawn timbers were used.

All felled logs were initially dried in forest yards for about a few months with the leaves still attached so that free water could be released from the sapwood. After sawing, the square timbers were air-dried for about 6 months by laying them in a timber yard.

Figure 2 shows a perspective view of the wooden eco house in which various innovative attempts were made to recognize our research and development.

For example, prefabricated small mud shear walls were introduced for shortening the on-site plastering job. Built-up beam system and timber board shear wall system were proposed for utilizing Sugi timber boards of 40mm thickness which were able to be supplied with sufficient quantity and dried relatively easily compared with square timbers.

In addition to these structural aspects, living termite nests are being kept under the ground of 1st floor to investigate the process of real termite attack against wooden residential house. This very unique wooden house is now being utilized as a full-scale specimen for measuring not only structural but also living environment performances in timber dwelling house.



Fig. 1. Wooden Eco House completed in November 2006 in Uji campus.

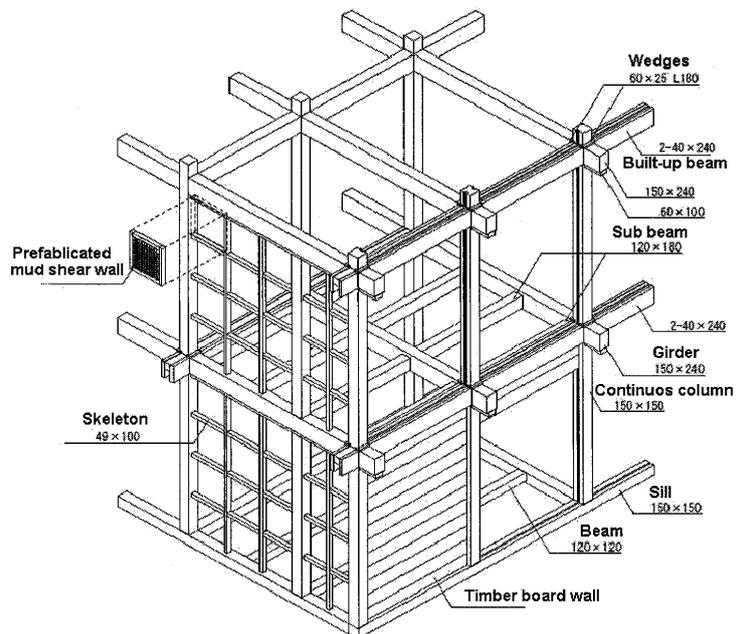


Fig. 2. A perspective view of the wooden eco house