

Investigation on “Sumiya”, an important National Cultural Treasure in Kyoto

(Laboratory of Structural Function, RISH, Kyoto University)

Kohei Komatsu, Takuro Mori and Akihisa Kitamori

Sumiya is located at the place where about 300m south from Tanbaguch station of JR Sagano line. This building is well known as the place in which the members of Shinsen-gumi or Samurais in Meiji Restoration made a lot of actions and now is an important National Cultural Treasure being considered as the only surviving masterpiece of the architectural style of “Ageya”(a two story building where guests were escorted to the main sitting room on the second floor) in Japan. During the summer in 2008, our project team could have an important chance for investigating this novel cultural building from the wood science and technology point of view by accepting special budget admitted by the Chancellor of Kyoto University. Our team was constituted from the specialists of wood anatomy, degradation and preservation of wooden building, fine architectural techniques including coloring investigation and those who investigate timber structures and their seismic resisting performance.

One day in hot summer, our team spent busy time for investigating under floor level, inside of roof, or/and taking microscopic photographs of important wood particles. Photo.1 shows a scientist set a precise velocity meter on a roof girder for measuring micro vibration of building. Photo.2 shows a feature of micro vibration measurement of Syu-oku building. Owing to this series of investigations, so far as we know, quite complicated 3-D structures of Sumiya could be first appeared as shown in Figure 1 although this is still not perfect. This building composed of two part, one of which is “Omote-ya”(rectangular building) along street and the other of which is “Syu-oku” (rough square) located at inside. We predicted seismic resisting performance of these two buildings by assuming strength properties of mud shear walls, columns and so on. Consequently we got a conclusion that these two buildings might be collapsed as shown in Figure 2 if quite devastating earthquake attacks on them. At the end of 2008 fiscal year, we had a seminar for presenting our all research activities and concluded our project by publishing an final investigation report.



Photo1. Dr. Shimizu setting a precise velocity meter carefully on a roof girder.

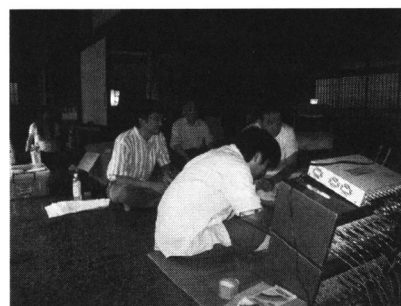


Photo2. Measurement of micro vibration of Syu-oku building.

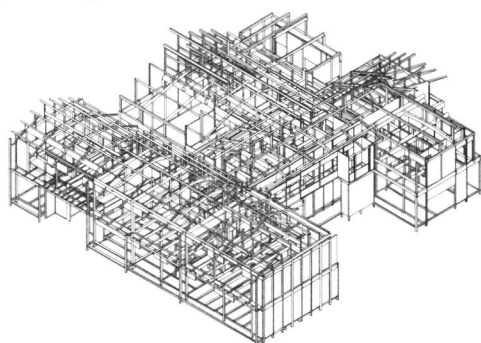


Figure1. Three dimensional image of Sumiya composed of Omote-ya (front side) and Syu-oku (upper side).

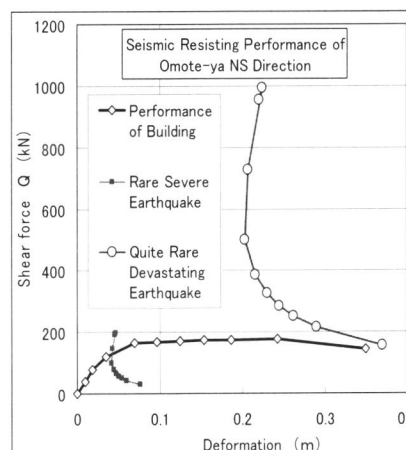


Figure2. Analytical result of the seismic resisting performance of Omote-ya.