

RECENT RESEARCH ACTIVITIES

Development of Timber-Concrete Composite floor system using Glulam and CLT

(Laboratory of Structural Function, RISH, Kyoto University)

Takuro Mori, Akihisa Kitamori, and Hiroshi Isoda

1. INTRODUCTION

To decrease the building weight has an advantage in reducing the seismic force. Therefore it is considered that the reinforced-concrete (RC) and steel (S) structure partially using wooden material contributes to decrease the building weight. Our laboratory has focused on this research area. Last year, we showed a reinforce system for RC frame using CLT panel. In this year, we carried out a study on hybrid floor system of timber-concrete composite (TCC).

2. CONNECTION TEST

The glulam and CLT was employed as a beam and slab material respectively. The connection of wood materials and RC the steel plate was used to expect with high rigidity. The connection between wood materials and steel plate is glued by an adhesive, the connection between RC and steel plate is joined by an adhesion. The several type of connection between wood materials and RC were indicated high stiffness. Finally, composite floor experiments were carried out by using joint plates showed good results.

3. FULL SCALE TEST & DISCUSSIONS

Glulam beam type and CLT slab type experiment as composite floor system with RC slab was carried out for two and one specimens respectively (Fig1). The size of specimen was 2,000 x 6,000 mm, in span of 5,400 mm. As a result, the initial destruction occurred in all specimens by being peeled off along the glue line between wood and steel plate at around 100 kN load. Although initial destruction strength were not enough, it exhibited a high rigidity as expected (Fig2). The straight line as "plus both stiffness" in Fig2 was illustrated by simply adding stiffness of both the wooden materials and RC slab. Compared with the straight line and experimental curve, it was found the experimental stiffness increased from 2 to 2.5 times higher. In the future subject, we aim to use these TCC floor systems in practical application by improving initial destruction strength.

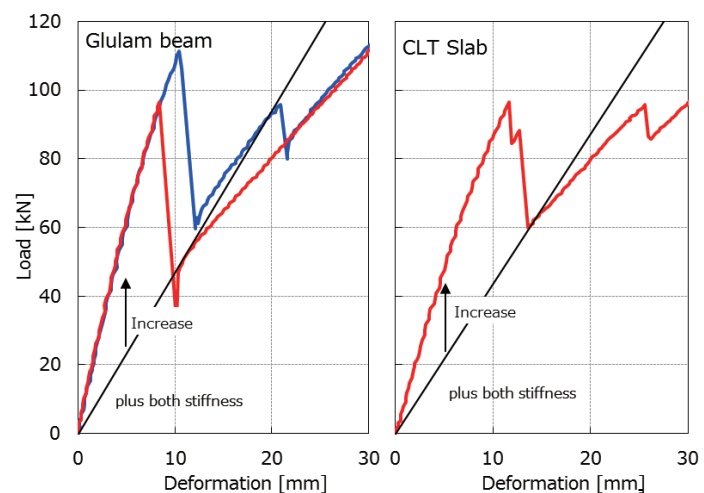


Fig1: Test scene of glulam beam with RC slab (Upper) and CLT with RC slab (Bottom)

Fig2: Load-deformation curve comparison between experimental value and simply added both materials stiffness.