

Diversity of “Space and Structure” in Timber Structures - Spatial Structures in Japan for the last 30 years-

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Abstract

From ancient times to modern times, Japan had been a technologically and culturally developed country with large scale wooden buildings such as Horyuji, a five-storied pagoda, and Himeji Castle. However, because Japanese building codes, the Urban Building Law in 1919 or the Building Standard Code in 1950, had restricted the construction of timber structures from the aspect of fire protection, almost no timber structures other than houses had been built until the late 1980s.

Deregulation of timber usage by amendment of the code in 1987 had promoted the construction of large timber structures using large-section laminated timber incorporating overseas joining technologies and calculation methods. Furthermore, re-amendment of the code in 2000 and the act on promotion of timber usage in 2010 supported to spread not only large-scale but also small-to-medium timber structures throughout Japan.

In a material selection aspect, because general circulation lumber and small-section laminated timber for residential use have availability, there are many application cases. Recently, applications of CLT are increasing. In a joint type aspect, not only types by overseas joints using steel plates and bolts but also traditional Japanese interlocking joints are commonly used. There are also types that combine them. When it comes to structural systems, there are various structural systems such as to exploit characteristics of timber to the full, to replace the conventional steel structures with wood, to combine steel and timber or to partially use of timber. And towards to realize landmarks in each area, breakthrough timber structures have been attempted throughout Japan.

This paper focuses on Japanese timber spatial structures in the last 30 years, while classifying based on some aspects, such as scales, materials, joints, systems and styles, and we will introduce features of the representative projects.

References

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