3-Hinge Frame Using CLT that Enables Push-up Construction

Kohei SHIMAMURA*, Osamu HOSOZAWA, Yumi SAKAGUCHI, Tomoaki SOMA

*Structural Design Division Taisei Corporation
1-25-1 Nishi Shinjuku, Shinjuku-ku, Tokyo 163-0606
kohei@arch.taisei.co.jp

Abstract
The building introduced in this paper is a wind tunnel test facility that accommodate an Eiffel-type wind tunnel unit. The building has an elongated planar shape of 9.5 m x 41.3 m and the building height is 9.0 m. The building was designed as a 3-hinge frame using the CLT that could be constructed using the push-up construction method.

CLT are large panels that measure 2.4 m x 9.5 m and have a thickness of 210 mm. The frame is made up of a unit consists of three large CLT members (a vertical member placed straight, an inclined member slightly tilted from vertical axis, and a roof member). The adjacent unit is assembled alternately and stabilized via a compression rod. The joint between the vertical, the inclined and the horizontal members functions as a rotatable hinge joint, making it possible to adopt the push-up assembly method.

In this paper, we report on the following points of the CLT frame in detail.

1) Overview of structural design and structural frame concept
2) Overview of joint structural testing and details of joint configuration
3) Push-up construction using mockup