

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

Kohei SHIMAMURA*, Osamu HOSOZAWA^a, Yumi SAKAGUCHI^a, Tomoaki SOMA^b

*Structural Design Division Taisei Corporation

1-25-1 Nishi Shinjuku, Shinjuku-ku, Tokyo 163-0606

kohei@arch.taisei.co.jp

^aStructural Design Division Taisei Corporation, ^bTechnology Center Taisei Corporation

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 2.4m x 9.5m and have a thickness of 210mm. 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

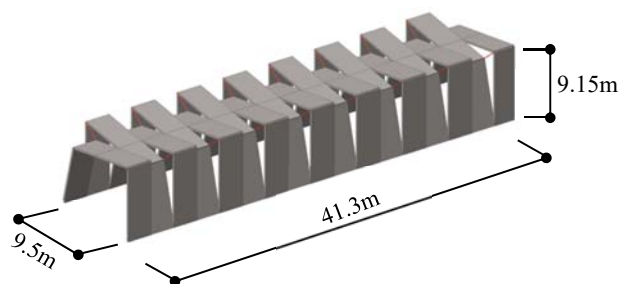


Fig. 1 Frame perspective view

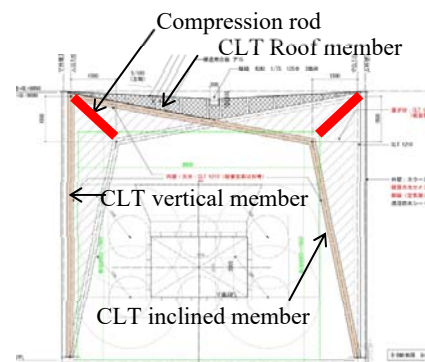


Fig. 2 Section view

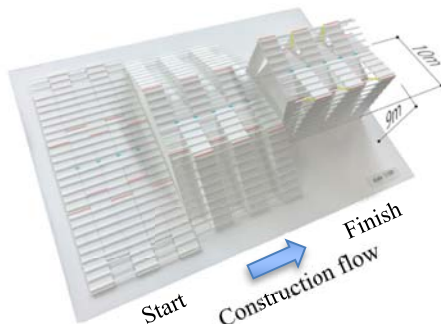


Fig. 3 Push-up construction method



Fig. 4 Perspective view of interior space