

October 15, 2021

For immediate release

Sumitomo Forestry Co., Ltd.

World's First Shake Table Testing of a 10-Story Wood Building
 Participating in the NHERI TallWood Project of 2022 taking place in the United States

Sumitomo Forestry Co., Ltd. (President and Representative Director: Toshiro Mitsuyoshi; Headquarters: Chiyoda-ku, Tokyo; hereinafter Sumitomo Forestry) announced that it will participate in the NHERI TallWood Project, which includes a shake table test of a full-scale 10-story wood building expected to happen in June 2022 on the NHERI (Natural Hazard Engineering Research Infrastructure) outdoor shake table facility at University of California San Diego (UCSD) in the United States. This will be the first shake table testing of a full-scale 10-story wood building in the world.

Colorado School of Mines leads the planning for the NHERI TallWood Project with grants from the United States' National Science Foundation (NSF)^{*1}. The building for the test will use post-tensioned seismic resistance technology^{*2} and validate earthquake resistance and construction technologies of medium- and high-rise wooden structures.

*1 National Science Foundation

This is a federal agency established in 1950 to promote the progress of science and technology in the United States. It has delivered many innovative research results, such as producing more than 160 Nobel Prize winners.

*2 Post-tensioned seismic resistance technology

This is a technology that increases the immobility between load-bearing members by putting tension on steel rods or wire strands of high strength passed through the members.

The International Building Code (IBC)—which forms the basis of the building codes of many local jurisdictions in the United States—was updated last year, allowing the construction of wooden structures up to 18 stories. This test is being conducted with the context of this revision. UCSD's outdoor shake table will be used to recreate the seismic waves observed during the Northridge Earthquake^{*3} which occurred in California in 1994 and actually shake the 10-story wood building being tested to validate earthquake resistance.



Fig. Overview of test building

Sumitomo Forestry will bear a portion of the test's costs, and use the information and knowledge obtained as reference for seismic resistance design in Japan.

*3 Northridge Earthquake

Also known as the Los Angeles Earthquake, it had a magnitude of 6.7 and resulted in 57 dead and approximately 5,400 injured, with 1,467 persons hospitalized. It is the earthquake with the highest economic losses in the history of the United States, with damage such as the collapse of highways.

To achieve medium- and large- scale wooden architectural structures, Sumitomo Forestry has been researching post-tensioned seismic resistance technology since 2014. This technology was first adopted in the fire resistance verification building that was constructed at Tsukuba Research Institute in 2015. It was also adopted for Tsukuba Research Institute's new research building completed in 2019. This test will be the first step toward the promotion of non-residential wood construction that contributes toward a decarbonized society.

As wood construction gains attention in the move toward creating a decarbonized society, Sumitomo Forestry is promoting the W350 Plan. Symbolized by a wooden high-rise building, this plan is a research and technological development roadmap aiming to realize a Timberized Eco City. Going forward, Sumitomo Forestry will continue to accelerate research and development to increase the value of wood.

■ Overview of test

Overview of test building

| | |
|-----------------------|---|
| Type of structure: | Wooden post-and-beam construction method using post-tensioned seismic resistance technology |
| Number of stories: | 10 |
| Plane area: | 9.7 m × 10 m |
| Height: | 34.14 m |
| Height of each story: | 3.96 m (1st story); 3.35 m (other stories) |
| Materials used: | LVL ^{*4} (pillars and beams), CLT ^{*5} (lateral load-bearing walls), and MPP ^{*6} (lateral load-bearing walls) |

Schedule (Expected)

Test building construction process will start in December 2021 with planned conduction of test in June 2022

NHERI TallWood Project: <http://nheritallwood.mines.edu/>

UCSD shake table: <http://nheri.ucsd.edu/>

*4 Laminated Veneer Lumber (LVL)

This is a wooden material made using veneers stripped from logs. The veneers are laminated with their fibers in a parallel direction.

*5 Cross Laminated Timber (CLT)

This is a wooden material made by laminating lamella together with the direction of their fibers perpendicular to each other.

*6 Mass Plywood Panel (MPP)

This is a wooden material with a large cross section made by laminating plywood. It is a wooden material developed in the United States with no specifications in Japan yet.