



ABURAMOTO Suzuka (left) of the Facility Planning Office, and MOCHINAGA Mai (right), director of the Facility Division and Disaster Prevention & Security Division at Japan Airport Terminal Co., Ltd., are enthusiastic about Haneda Airport's decarbonization efforts and future prospects.

# AIMING FOR A SUSTAINABLE AIRPORT TERMINAL: INTRODUCING A HYBRID WOOD-STEEL STRUCTURE AT HANEDA AIRPORT

*Tokyo International Airport (Haneda Airport) has decided to employ a hybrid wood-steel structure for its new north satellite facility at Terminal 1 as part of its efforts toward decarbonization. Combining carbon reduction and seismic resilience with aesthetic appeal, the new facility—still under construction—will showcase Japan's unique craftsmanship.*

Japan is steadily heading toward its goal of net-zero emissions by 2050, aiming to effectively eliminate greenhouse gas emissions. Airports are playing a crucial role in these efforts, especially given that planes emit a comparatively large amount of carbon dioxide per unit of transportation relative to buses and trains. Construction began in May 2024 on a new satellite facility using a hybrid wood-steel

structure, situated to the north of Terminal 1 at Tokyo International Airport (Haneda Airport), as part of its decarbonization initiatives. "Our initial plans didn't in fact incorporate any wood, but during review suggestions came in—mainly from younger staff—to take on the challenge of using it, so we decided to change our plans," notes ABURAMOTO Suzuka from the Facility Planning Office

at Japan Airport Terminal Co., Ltd., the firm that constructs, manages, and runs Haneda Airport's passenger terminals. "Initially, there were all sorts of concerns about whether it could meet the requirements for a passenger terminal in terms of seismic resistance, fire resistance, and functionality, but we addressed and resolved them one by one. Younger employees

took the initiative to sound out stakeholders, visit wooden building material factories, and investigate the durability of old wooden structures, gathering data and materials." As a result, they arrived at a hybrid solution incorporating steel frames for the first floor, which experiences heavy traffic from ground vehicles, and wood for the upper floors used by passengers, ensuring safety, functionality, and comfort.

Aburamoto explained, "We discovered that opting for wooden construction could reduce CO<sub>2</sub> emissions during construction by 2,630 tons, which sparked enthusiasm among younger employees." Buildings that seek to achieve a net-zero energy



Digital rendering of the completed hybrid wood-steel structure used for the new north satellite facility extending from Haneda Airport Terminal 1. JAPAN AIRPORT TERMINAL CO., LTD.

balance annually, while ensuring comfortable indoor environments, are referred to as Net Zero Energy Buildings (ZEBs). But before making that grade, Haneda Airport Passenger Terminal first wants to gain "ZEB Oriented" certification as the preliminary step on the domestic ZEB index. The goal is to reduce annual primary energy consumption in the new facility by more than 30%.

"In the aim for ZEB certification, there is a tendency for builders to avoid large windows to prevent rising indoor temperatures stemming from direct sunlight. But that would deprive customers of the enjoyment of watching airplanes through the windows. We therefore aimed to balance energy efficiency with comfort in the terminal building, which is why we decided to pursue ZEB Oriented [certification] first," according to Aburamoto.

Meanwhile, MOCHINAGA Mai, director of the Facility Division and Disaster Prevention & Security Division at Japan Airport Terminal, is optimistic about the possibility of the ripple effect that the initiative at Haneda Airport may have on the rest of the country. "Haneda Airport is the first among Japan's 28 major airports to adopt a hybrid wood-steel structure for its terminals. Achieving that at Haneda—the

gateway to Japan's skies—should serve as a useful reference point for decarbonization efforts at other airports nationwide," she said.

Japan's unique technologies are also being used in the new north satellite terminal. For instance, a construction method has been employed that ensures high seismic resistance while maintaining an aesthetically pleasing appearance through the use of hidden bolts and components. The building can therefore meet Japan's strict earthquake standards while maintaining its beauty. And in waiting areas, the aim is to create an efficient air conditioning system by circulating temperature-controlled air from below the floor rather than blowing it down from the ceiling.

Additionally, Haneda Airport is looking into introducing AI-based temperature control systems that target high traffic areas, while working with other companies to explore hydrogen as a promising next-generation energy source.

Mochinaga is resolute in her determination. "I want to transform airports from mere transit hubs into memorable spaces. By using domestically sourced wood, I hope that we can help people feel connected to nature as we create a state-of-the-art airport that benefits both the environment and people." ●



Top: Digital rendering of a completed waiting area in the north satellite. Temperature-controlled air will be circulated from the floor, ensuring effective air conditioning for the whole space. JAPAN AIRPORT TERMINAL

Bottom: Digital rendering of a completed boarding bridge, which evokes an eco-friendly feel while maintaining the warmth of the wood. JAPAN AIRPORT TERMINAL