

FEATURE:

WE'RE BEHIND MODERN WONDERS OF THE WORLD

02

NEW INTERNATIONAL PASSENGER TERMINAL, HANEDA AIRPORT

For airport terminal buildings, securing a wide expanse with good visibility is critical. From there, Kajima technologies for erecting massive roofs, embodying the Company's originality and ingenuity, were put to use.



KAJIMA'S BUILDING CONSTRUCTION TECHNOLOGIES

ASSESS

SWIFTLY SURVEYING PILE FOUNDATION BEARING LAYERS AT MORE THAN 10 TIMES CONVENTIONAL SPEED

Our initial boring survey revealed that the terminal building was planned on a stretch of land where the undulation of the bearing layers was peculiarly large. Completing piling within a limited construction schedule required, on the one hand, additional surveys to precisely assess the layers underground. At the same time, due to height regulations to maintain safety in the sky, construction cranes and other equipment and machinery had to be removed from the project site each day once work was completed.

To clear these stringent hurdles, "Geo-Explorer," Kajima's self-developed soil-exploring vehicle, played a major role. Introducing this vehicle enabled highly precise, continuous soil surveying at 10 times the speed of conventional boring survey methods. Survey results were also displayed in real time, which contributed greatly to shortening the construction period.

In the end, Kajima completed a survey of 69 different points and a cumulative depth of 4,000 meters in a short 20 days. The detailed assessment of the ground layers also helped achieve higher quality, lower construction costs, and a shorter time for the foundation work.



Inside the Geo-Explorer truck



Steel pile construction work

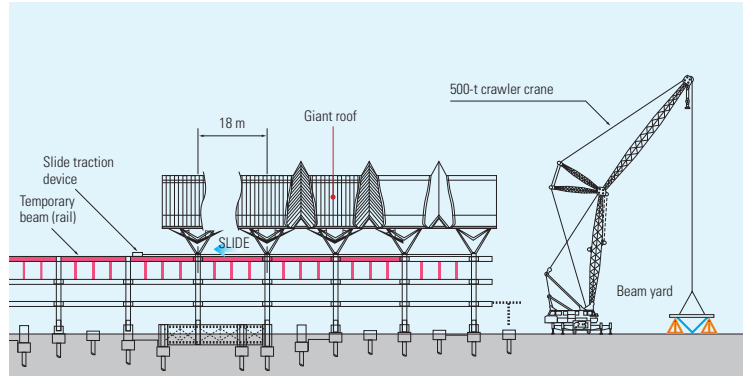


Soil strata survey using the Geo-Explorer truck

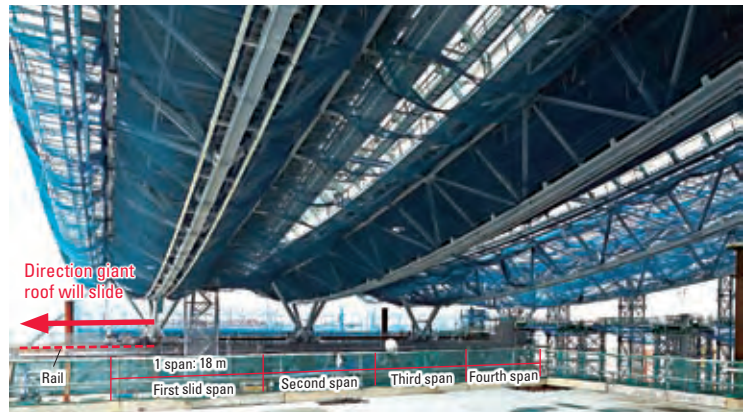
MOVE

JAPAN'S FIRST AND ONLY TECHNOLOGY FOR MAKING A 5,000-T SLIDING ROOF A REALITY

One of the major challenges in this construction project was how to construct and install the enormous roof, which is 178 meters long, 95 meters wide, and weighs in at 5,000 tons. Various techniques were explored for building the roof, including the "Lift-up Method," whereby the roof was assembled on the ground and then hoisted up into position. However, because subway lines run beneath the site, installing massive cranes in what would be the center of the building directly over tunnels was not feasible. Ultimately, Kajima decided to adopt the "Slide Method." With this method requiring delicate execution, the roof was divided into spans at one side of the building, which were then assembled and slid horizontally into position. The introduction of this method to a 5,000-ton roof was unprecedented, but Kajima met this tough challenge and successfully completed the work.



"Slide Method" overview diagram



Actual roof installation using the "Slide Method"

COMMENTS FROM THE PROJECT MANAGER

CONSTRUCTION AS THE EMBODIMENT OF IDEAS ONSITE

My job started with gathering talented specialists from various fields to form a strong team to complete this tremendously complex project. Connections we cultivated from past project teams were vital here, and the close partnerships we formed with sub-contractors enabled us to deliver a higher-quality project.

Construction of a large roof for Haneda Airport Building was a complex process. Because of this, it was important to visualize how the entire project would look like from start to finish. By virtue of it being such a large-scale construction, staying true to the basics by pursuing each image in turn and methodically carrying out plans, while anticipating conceivable risks, was very important.

For this building, we drew upon Kajima's high-level construction technologies to make the steel structure slimmer, installed new seismic damping equipment, devised support techniques for the large-scale curtain wall and massive roof, and developed information and communication facilities. We also turned our attention to environmental considerations. The use of solar panels and geothermal energy are examples. In addition, we installed wind generators at the project site office as part of an extensive energy-saving program.



TOSHINARI OTAKE
Project Manager