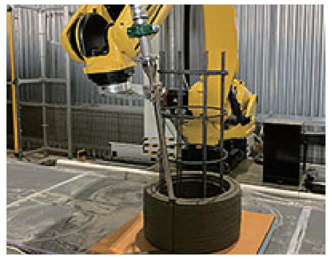
Examples of Our Solution with Technology and DX

We continuously refine our technologies, which serve as the source of our competitive edge, and enhance our ability to solve client and societal issues at every stage of the construction value chain.

Promoting the Development of "T-3DP®" 3D Printing Technology for Construction

Social and Environmental Issues

We have developed the mobile "T-3DP®" (Taisei-3D Printing)" system, which combines articulated robots with 3D printing technology for construction, enabling on-site fabrication of large reinforced concrete components. This system allows for the creation of structures with optimal cross-sectional dimensions by enabling the production of larger components and utilizing a three-dimensional approach for the printing nozzle, leading to further improvements in construction productivity.

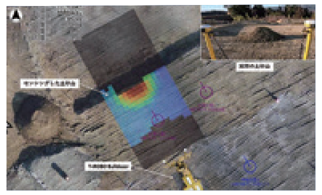


Construction near reinforcing bars

Promoting the Development of T-iRobo® Series for Construction Machinery Automation Expanding the Functionality of the Autonomous T-iRobo® Bulldozer

Strengthening of Social Infrastructure

Since 2013, we have been developing the "T-iRobo® Series," a line of autonomous and remote-controlled construction machinery. In 2023, we enhanced the capabilities of conventional automated construction machines by introducing a bulldozer capable of detecting sand and soil piles and autonomously determining the optimal route for earthmoving and leveling. By advancing autonomous operation technology, we aim to further improve productivity and safety while promoting unmanned and labor-saving construction operations.

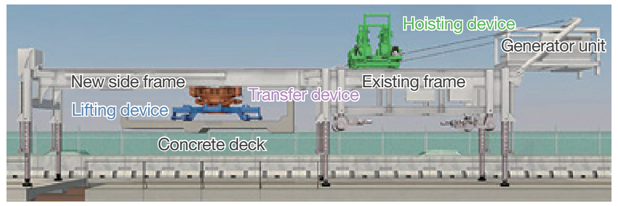


Visualization screen of soil pile sensing results

New Method for Half-Section Floor Slab Replacement Used in Expressway Renewal Projects, Significantly Shortening Construction Periods

Strengthening of Social Infrastructure

In collaboration with Kitagawa Corporation, we have developed a half-section floor slab replacement machine that is not classified as a crane and can be used with lane restrictions on only one lane of a two-lane road. The introduction of this system reduces the number of days required for the machine's assembly, disassembly, and inspection to one-third of conventional methods, and shortens the floor slab replacement period for weekend construction to one-quarter of the usual time. Moving forward, we will actively propose and implement this machine in expressway renewal projects across Japan, aiming to further improve the safety and productivity of floor slab replacement work.

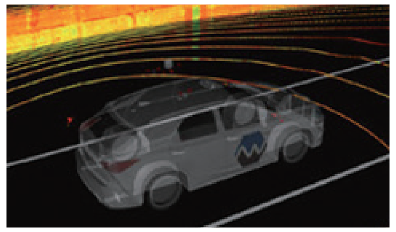


This replacement machine consists of two large components, the new side frame and the existing side frame, along with various units attached to them.

Leading the Way in Urban Development for an Autonomous Driving Society

Regional Revitalization and New Frontier Business

We are collaborating with Tier IV, Inc., a leading developer of autonomous driving software, to jointly develop infrastructure technology for autonomous vehicles. By applying highly reflective paint to tunnel walls to aid in vehicle positioning, we have successfully reduced the positional error within tunnels from a previous maximum of 100 cm to approximately ±10 cm. Moving forward, we aim to further improve accuracy and contribute to the realization of safe autonomous driving. We will continue our efforts nationwide to support the government's goal of deploying autonomous driving services in at least 50 locations by FY2025 and over 100 locations by FY2027.



Providing tunnel automated driving assistance technology (infrastructure coordination technology)

Development of Silencer for 24-hour Ventilation Air Supply Port "T-Silent® Sleeve"

Social and Environmental Issues

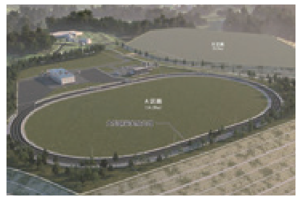
In collaboration with MIYACHU Co., Ltd., we developed the "T-Silent® Sleeve –SHIZUKANKI–," an air inlet sound insulation device for 24-hour ventilation systems in residential buildings, combining superior design aesthetics with excellent ventilation performance. This device achieves sound insulation performance comparable to conventional soundproof vent caps* while preserving the architectural aesthetics of the building's exterior and maintaining optimal airflow. It is suitable for both new and existing homes and has already been installed in apartment complexes in Tokyo. Going forward, we will actively propose this technology as a noise reduction solution for air inlets.

*Ventilation cap placed on air supply/exhaust openings on exterior walls.

Construction Begins on Next-Generation Pavement Test Track

Social and Environmental Issues

Taisei Rotec Corporation has commenced construction on a Next-Generation Pavement Test Track (tentative name) at the East Industrial Park in Tamura City, Fukushima Prefecture. With the goal of achieving a carbon-neutral society, we will conduct durability tests on various technologies, including concrete pavement that facilitates CO_2 fixation, solar power-generating pavement, and asphalt pavement utilizing plant-derived materials, all contributing to decarbonization.



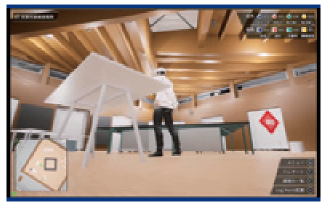
Large pavement test track

In the PDF version, each item is linked to releases and other relevant materials on our website for further information. (Japanese only)

Began Development of the Construction Approval Metaverse™ to Accelerate the Transition to Next-Generation Workstyles

DX of Production Process

We have commenced the development of the Construction Approval Metaverse, a collaborative project with Hitachi Consulting Co., Ltd., GlobalLogic Japan, Ltd., and Hitachi Social Information Services, Ltd. This metaverse, built on BIM* (Building Information Modeling), aims to centralize the information necessary for consensus building among project stakeholders (such as clients, designers, and contractors) within a three-dimensional virtual space. By eliminating misunderstandings among stakeholders during project presentations and the process of reaching agreements on specifications, the system will enable more efficient project execution while contributing to operational efficiency and work style reform at construction sites.



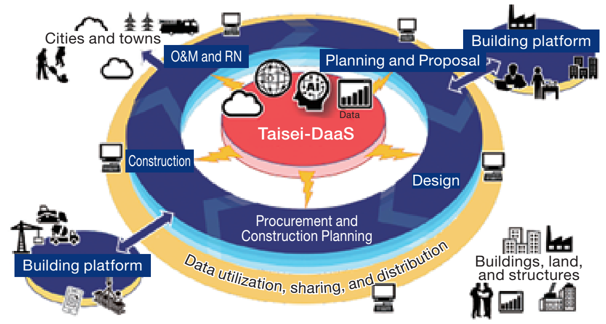
Introductory video of the Construction Approval Metaverse concept

*BIM: Building Information Modeling is a system for creating and managing a digital representation of a building. It integrates 3D geometric information with a wide range of building attributes, including room names, areas, material specifications, and performance data.

Establishment of Taisei-DaaS (Taisei-Data as a Service), a Company-Wide Integrated Platform for Data Utilization and Sharing

DX of Management Foundation

We have built Taisei-DaaS, an integrated platform that seamlessly connects and utilizes various data generated throughout the construction life cycle—from planning and proposal to design, construction, and renewal. By facilitating better-informed management decisions and operational enhancements across various business areas, we can now quickly and accurately propose and respond to customer needs across the entire construction life cycle.

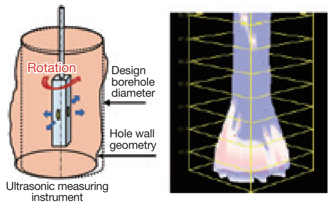


Conceptual diagram of data integration and utilization through Taisei-DaaS

Development of "T-Pile 3D Monitor" Technology for Measuring Excavated Ground

DX of Production Process

We have developed the T-Pile 3D Monitor, a 3D measurement technology that enables accurate and quick assessment of the shape of excavated ground during the construction of foundation structures such as cast-in-place piles and diaphragm walls. This system uses an ultrasonic measuring instrument that rotates circumferentially inside the borehole, performing automated measurements at user-defined angles. By using this technology, we can reduce the amount of residual concrete and CO_2 emissions during the installation process. In the future, the T-Pile 3D Monitor will be actively applied across both civil engineering and building construction fields, as part of our series of technologies for pile and diaphragm wall construction.

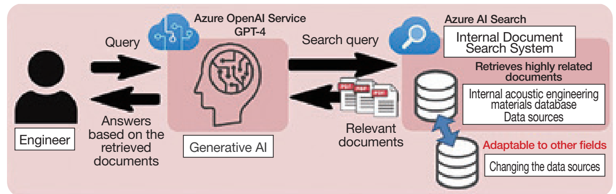


T-Pile 3D Monitor measurement image

Development of Specialized Technology Search System Using Generative AI

DX of Production Process

We have developed a Specialized Technology Search System that utilizes generative AI to provide highly reliable answers to technical queries. This system enables us to leverage the vast amount of technical data stored in internal documents, enabling significant improvements in operational efficiency, productivity, and the smooth transfer of specialized knowledge to the next generation. The first practical application of this system is a search system specializing in acoustic technology. We plan to apply this system to various other specialized fields in the future.



System Configuration and Search Procedures

Development of "Field Checker" Application for Supporting Surveying with Cloud

DX of Production Process

We have expanded the functions of T-iDigital® Field, an integrated system that supports construction management by utilizing various digital data obtained at construction sites. As part of this expansion, we developed the Field Checker application, which allows one person to efficiently carry out basic surveying tasks that previously required two people.

This application leverages positioning equipment and cloud technology to significantly improve the efficiency of survey work.

Development of T-Hospital® Connect for Medical and Nursing Care Facilities

DX of Services & Solutions

In collaboration with InfocubeLAFLA, Inc., we have developed T-Hospital® Connect, an IoT data platform for medical and nursing care facilities. This platform integrates, manages, and enables the effective utilization of location, and video data as well as health, environmental data for patients and long-term care recipients. By consolidating and visualizing data from various IoT devices related to patients, medical equipment, and the environment, this platform enables centralized management and facilitates efficient utilization of information, thereby streamlining healthcare professionals' management tasks and enhancing patient safety while improving overall medical services.