SPECIAL CONTENTS

# Shimizu's Monozukuri

The spirit of "sincere monozukuri (craftsmanship)" has been handed down through our company. This impels us to use our proven technological expertise and commitment to quality and safety in crafting buildings and structures, delivering value above and beyond the expectations of society and our clients. In this Special Content feature, we use specific examples to illustrate our monozukuri approach.



## Special Content 1-1 The Construction Site

# BLUE FRONT SHIBAURA TOWER S

**BLUE FRONT SHIBAURA is a project for the integrated development of office, hotel, commercial and residential space, set to transform the Tokyo Bay area.**

Here, we are replacing the Hamamatsucho Building (the former Toshiba Building) with twin towers TOWER S (completed in February 2025) and TOWER N (due to complete in FY2030).
This large-scale mixed-use development, around 230 meters high and containing roughly 550,000 square meters of floor space on a 4.7-hectare site, housing office, hotel, commercial and residential space, will serve as a "link" between the Tokyo Bay area and the city center.
We mustered our collective strength to successfully complete the first of the towers as a major milestone in bringing this huge project to fruition.

### Project outline

| | |
|---|---|
| Location | 1-1-1, Shibaura, Minato Ward, Tokyo |
| Site area | 40,104.29m$^2$ |
| Construction period (Phase I) | October 1, 2021 - February 28, 2025 |
| Client | Nomura Real Estate Development Co., Ltd. |
| Design | Maki and Associates; Shimz DESIGN; Ove Arup & Partners Japan Ltd.; Nikken Sekkei Ltd. |

### Building outline

| | |
|---|---|
| Purpose | Office, hotel, retail, hospitality, services and car parking space (Phase I) |
| Architectural structure | Steel frame, steel reinforced concrete (SRC), and reinforced concrete (RC) |
| Footprint | 28,365.67m$^2$ |
| Floor space | 267,424.57m$^2$<br>Phase I & II 550,596.26m$^2$ |
| Floor area ratio | 1,120 % |
| Floors | TOWER S (Phase I)<br>3 below ground, 43 above ground, 2-story penthouse |
| Height | 228.88 m (Phase I) |

### Civil engineering project outline (infrastructure development)

| | |
|---|---|
| Location | 1-chome, Shibaura, Minato Ward, Tokyo |
| Construction period (Phase I) | June 28, 2019 - December 31, 2025 |
| Design and supervision | Shimizu Corporation |
| Structure and scale | Road infrastructure (4 municipal roads, 1 Tokyo metropolitan road)<br>Bridge construction (1 river bridge, 1 canal bridge)<br>Parkland and floating pier/promenade development (1 each) |

### Civil engineering project outline
(east-west walkway to JR Hamamatsucho Station South Exit)

| | |
|---|---|
| Location | Minato Ward, Tokyo (JR Hamamatsucho Station South Exit) |
| Construction period | April 14, 2021 - July 31, 2026 |
| Client | East Japan Railway Company |
| Design and supervision | JR East Consultants Company |
| Structure and scale | 3-span continuous steel plate deck plate girder bridge<br>Deck: girder length 79.3 m; steel weight 317 tons<br>Foundation: abutment A 455 tons; abutment B 133 tons; pier P3 63 tons; pier P4 39 tons |

BLUE FRONT SHIBAURA TOWER S (at center)
To south (at left): Seavans N Building
To north (at right): Hamamatsucho Building (former Toshiba Building)

## Special Content 1-1 The Construction Site

# We are working on this large mixed development project in Shibaura, Tokyo hand-in-hand with our client.


### Monozukuri That Leverages Shimizu's Unique Collective Strength

The unique features of Maki and Associates' basic design of the building are the views afforded by an aluminum curtain wall constructed using 18-meter span external columns and special glass, and a three-tiered setback profile on the building's east and west faces. To achieve these features, the structural planning was undertaken by our Design Div. at the working design stage, employing our BILMUS vibration control technology for the first time in Japan and using floor trusses at the three levels where the pillars shift location to give the stepped profile. Our Design and Construction Technology Div., Engineering Headquarters and Institute of Technology worked together with our on-site team to overcome the issues in such a highly complex building structure.
Our Civil Engineering Headquarters took charge of infrastructure provision between the building and Hamamatsucho Station, with the construction and civil engineering teams working in close alignment to progress the project. This integrated approach enabled us to deliver a high-quality building to the client as planned in the overall construction schedule and we see it truly as a work of art born of our collective strength.

Satoshi Yagi
Project Director

## Design

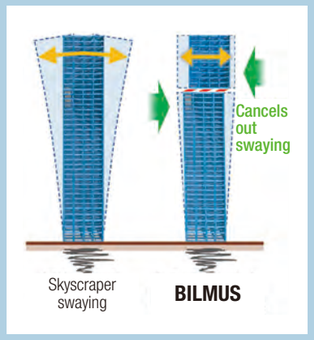
We marshalled our design and construction expertise to create a masterpiece for future generations with global starchitect Fumihiko Maki.

### Monozukuri Through Collaboration

Very large projects require participation from many architects, engineers and designers. We have progressed this project hand-in-hand with many other architects, engineers and designers in addition to basic designer Maki and Associates. Our firm provided the pivotal axis for this collaboration, managing a thousand and one minute collaborations from design of the overall building design, through interiors for the shared areas of the office space and commercial spaces, down to signage, in order to marry function with design. Our monozukuri has achieved a holistic work of art out of a myriad parts.

### Building Itself as Vibration Control System Halves Swaying

Our newly developed BILMUS vibration control technology has enabled a building that is both highly disaster-proof and has the freedom of design permitted by a far smaller number of pillars than conventionally used in skyscrapers. The distinctive characteristic of the BILMUS system is that the building itself functions as a vibration control system, making it highly resistant to swaying without the installation of any damping devices. This will reduce swaying particularly on the higher floors, which house a luxury hotel, by half compared with conventional skyscrapers, greatly reducing the risk of falling furniture or appliances and of interior and exterior damage. This helps enhance the value or our product.




BILMUS minimizes swaying

### A Design to Maximize the Potential of the Site

A skyscraper facing Tokyo Bay offers views unparalleled in the city center. We aimed to make the most of this advantage by using airflow windows for adjusting the air-conditioning to improve thermal insulation, with the system responsive not only to solar radiation outside the building but also controlled by environmental sensors that monitor the flow of people in the building. We developed a window blind control system that controls the angle of the slats for installation on some floors. This, together with the use of radiation cooling, has lowered the building's carbon footprint while making the most of the spectacular views, with the technology also supporting the drive for higher office worker productivity.

A typical office view

### Full Hotel Support Through Project Management plus Interior Design

The top floors will house Japan's first Fairmont Hotel. To accommodate this luxury hotel brand at a high level, we provided a full support package supplementing our normal design and construction with hotel project management team. The project management team worked hand-in-hand with Fairmont at virtually every stage, from the formation of an initial design team, encompassing overseas designers, to the final preparations for opening, smoothing the project's way forward. This has delivered a world class hotel that is both designer quality and highly lucrative.

The hotel's open and airy lobby and lounge

### Supplying ICT Solutions for a Luxury Hotel

We supplied Fairmont Tokyo with suitably high-end hotel ICT solutions. We developed ICT services for hotel guests that meet the Fairmont brand's technology and quality standards and are also distinctively Japanese. By building on and localizing systems that other foreign luxury hotel chains have implemented in Japan, we were able to deliver a system optimized in both functionality and cost. Building the system called for negotiations with this overseas hotel group's IT department and the smooth coordination of the multitude of designers and the construction teams involved in building the hotel. We undertook everything from IT consulting through construction management and design supervision.

A typical hotel room

# Construction

Shimizu's celebrated monozukuri, combining architectural, civil engineering and digital knowhow, delivers quality, precision and efficiency in Shibaura, where the land, sea and air meet.

## Removal of Excavated Soil by Boat

The site road runs alongside the Shibaura Canal. We negotiated the construction of a canal pier with the Tokyo Metropolitan Government Bureau of Port and Harbor, enabling us to take advantage of this to remove excavated soil from the site by boat. Dump trucks brought excavated soil to a small boat moored alongside the pier, which took it to a large vessel anchored in Tokyo Bay for transport to the final disposal site.
The use of this marine transportation in parallel with conventional land transportation enabled us to remove up to 4,500 tons of excavated soil a day from the site, dramatically curtailing this process. Ultimately, 104,600 tons of soil, 40% of the total, was removed from the site by boat, with this more efficient transportation also reducing the environmental burden.

A temporary pier enabled transportation of excavated soil away from site by boat

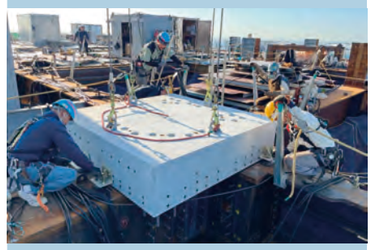
## Constructing Basement Floor First Enabled More Efficient Materials Transportation

After completing excavation for the underground levels, we constructed the first-floor slab, allowing us to work simultaneously on the below- and above-ground structures, using a two-step construction method. When constructing the first-floor slab first, it is usual to leave an opening in the slab for lowering materials to the underground construction area and to use manpower to move them horizontally to where they are needed, which is quite labor-intensive.
In this project, we preconstructed sections of floor to serve as a passageway for materials transportation on the first and second basement floors, enabling more efficient vehicular transportation. As a result, the construction of the basement structure, using 4,800 tons of rebars, 84,000 square meters of formwork and 32,000 cubic meters of concrete, took only around five-and-a-half months, shorter than it usually would.

Preconstructed floor for basement materials transportation

## Speed and Precision in Constructing Earthquake-Proof Base-Isolation System 170 meters Above Ground

Constructing a base isolation system is complicated, requiring a multitude of processes; even more so in a skyscraper requiring such a system 170 meters or so above ground. A crucial issue was how to maintain the precision of the building frame while reducing the length of time needed to construct the frame of the base isolation system.
The solution we came up with was that after we finished building the steel frame for the office floors, we installed the upper part of the base isolation system, manufactured off site, on top of the steel frame. This reduced the volume of work done on site and greatly reduced base isolation system structural construction time. This shortened overall construction time by around six weeks and achieved a margin of error in base isolation system installation at 170 meters or so above ground of just ±2 millimeters.



Installing precast base isolation layer on the steel frame

## 18-Meter External Column Spans to Maximize the Views

So that the building could feature open views from the office space, we used 18-meter external column spans in standard areas, employing cantilever beams projecting by up to 18.6 meters, with no corner pillars. Given the difficulty of maintaining structural precision and the absence of any precedent for such large spans in a skyscraper, we had all related departments brainstorm issues.
We were meticulous in planning steel frame construction, pre-calculating the downward deflection of girders by the weight of poured concrete slabs and intentionally cambering girders upward. Thanks to carefully checking structural precision at every step of construction, we were able to create a high-quality, high-precision building with scenic views intact.

View of the 18-meter span external columns on the first floor

## Proactive Use of Construction Robots

Lifting materials and equipment in skyscraper construction is very labor-intensive given the huge volumes and range of materials and the increasing distances involved as a building grows higher.
On this project, we used automated conveying robots and temporary elevators during the night for lifting plasterboard and fire resistive covering material to reduce the amount of manpower required. This sharply reduced the loads that the temporary elevators needed to lift during the day, easing the transportation of construction workers and raising productivity on the site as a whole.
With shortages of skilled workers for steel frame welding and fire-resistant coating a concern, we used this project as a test bed for the welding robot and fire-resistant coating robot we are developing, which has greatly spurred technology development in both areas.

Experimental use of our fire-resistant coating robot

## Integrated Network Design and Construction

We designed, built and installed an integrated network for collating data pertaining to the range of equipment in the building and utilizing data needed for the future to make the building easier to manage and use. Providing an optimized integrated network required coordination with the many makers of building equipment and the vendors that install it to ascertain the bandwidth, network redundancy, security measures and access restrictions required. This integrated network has realized "digital spaces and services provision," one of the cornerstones of our SHIMZ Digital General Contractor 2.0 strategy.

External view of completed building

## Infrastructure Development

We had to manage 24 peripheral construction sites alongside the TOWER S construction site. This included reconstruction of the Shinshibaura Bridge and Furukawa Bridge, construction of a Tokyo metropolitan road intersection and four new Minato Ward municipal roads, relocation of a ward park, construction of a floating pier, sewerage installation and the construction of new earthquake-proof revetments. This involved design talks with more than 30 partners, including Minato Ward government as well as waterway, harbor, railway, metropolitan expressway and maritime organizations, and the extremely difficult process of progressing design and construction in parallel. Reconstruction of the Class B Furukawa river revetments was particularly demanding due to the confined construction space and height restrictions as well as the need to minimize disruption to the metropolitan expressway and Shinkansen line. Our team had to work round-the-clock using the Gyropress Method™*.
We also had to install an east-west walkway to the South Exit of JR Hamamatsucho Station between the JR and Shinkansen lines underneath and the overhead Monorail. We used a tower crane and 750-ton crawler crane to install the 79.3-meter-long girder in the confined space above the rail lines and below the Monorail in a narrow 115-minute time window after the last train.

* Gyropress Method™ is a rotatory method for driving steel tubular piles with cemented carbide blades on the end into the ground, jointly developed by Nippon Steel Corporation and Giken Ltd.


Gyropress use in revetment reconstruction

Walkway girder installation above the rail lines

East Japan Railway Company
Photography cooperation

Special Content 1-2 The Construction Site

# Sotetsu/Tokyu Shin-Yokohama Line, Shin-Yokohama Station, etc.

**The new Shin-Yokohama Station on the Sotetsu/Tokyu Shin-Yokohama Line opened in March 2023. We successfully completed the long-term project that spanned over more than 10 years, and by actively incorporating ICT into construction, we contributed to the advancement of civil engineering technology and society.**

### Construction Overview

| | |
|---|---|
| Location | 2 Shin-Yokohama, Kohoku-ku, Yokohama |
| Client | Japan Railway Construction, Transport and Technology Agency |
| Design and supervision | Japan Railway Construction, Transport and Technology Agency |
| Construction period | [Civil engineering]: February 2013 - May 2024<br>[Architecture]: May 2019 - February 2023 |
| Structure/size | [Civil engineering]<br>Total length: 249 m<br>Excavation width: 12.5 to 25 m; excavation depth: 33 m<br>Steel-reinforced continuous underground wall (utilized for the main structure): 17,813 $m^2$<br>Excavated soil volume: 143,406 $m^3$;<br>pavement covering: 5,030 $m^2$<br>Structural concrete: 28,490 $m^3$<br>[Architecture]<br>Reinforced concrete, steel<br>B4-2F<br>Building: 669 $m^2$<br>Floor area: 22,900 $m^2$ |

## Direct connection between Sotetsu and Tokyu establishes regional railway network

The Sotetsu/Tokyu Shin-Yokohama Line is a new connecting line that links about 10 km from Hazawa Yokohama-kokudai Station on the Sotetsu-JR direct line to Hiyoshi Station on the Tokyu Toyoko Line. Of the two new stations opened along this section, our joint venture was responsible for the construction of Shin-Yokohama Station. The opening of this line has established a wide-area railway network connecting central Kanagawa Prefecture and central Tokyo, which is expected to reduce travel time, decrease the number of transfers, and improve overall railway convenience.

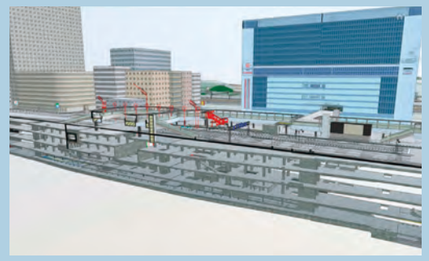
## Large-Scale Excavation Project to Build a Station Building Directly Beneath the Yokohama Circular Line 2

A large-scale excavation project was conducted, creating a work zone on the heavily trafficked Circular Line 2 and constructing the station building directly beneath it. One of the most critical aspects of underground station construction is the precise creation of a steel wall that serves both as the station's structural wall and as a retaining wall for the surrounding ground. A total of 780 steel-reinforced continuous wall components, each 40 meters long, were divided into four 10-meter sections and installed underground through continuous day-and-night operations carried out over two years. Furthermore, due to the urban construction environment, it was necessary to build a complex-shaped structure in areas where many buried utilities were densely and intricately located. By incorporating digital twins (a virtual model that accurately reproduces the structure in digital form) from the construction planning stage and conducting detailed design and simulations in 3D space, we were able to achieve efficient construction management. These efforts contributed to the advancement of civil engineering technology and society, leading to our receipt of the 2024 Japan Society of Civil Engineers Technology Award (Group-1).

Steel-reinforced continuous underground wall components installed along Circular Line 2

## Striving to Visualize and Enhance Site Management by Fully Leveraging Digital Tools

We used digital twins to run construction simulations and provided the results back to the site, enabling highly precise construction management. This digital space was shared with stakeholders through the cloud, streamlining information sharing, and the construction was carried out under a management system that integrated all stakeholders. Additionally, we actively leveraged various ICT technologies, including VR, AR, and remote management, to enhance productivity. These efforts were awarded the Excellence Award at the Ministry of Land, Infrastructure, Transport and Tourism's 2021 i-Construction Grand Prize, which recognizes initiatives that enhance construction site productivity through the use of innovative technologies.



Entire station building modeled in BIM in-house

## Successfully Completed Challenging Construction Project with Numerous Coordination Issues

As the construction work was carried out within the structure built by the civil engineering team, it was necessary to measure the actual dimensions of the structure and revise the construction drawings accordingly. We used digital twins to run construction simulations and provided the results back to the site, enabling highly precise construction management. To ensure a high-quality finish when placing concrete deep underground in a long, horizontal space, all parties involved collaborated and shared ideas to refine the approach. The steel framework for the core of the wall was assembled in an extremely confined space, using mini cranes and aerial work platforms to get the job done. Furthermore, the lifting of materials through floor openings using a ground-installed crane included lifting other equipment like electrical systems, air conditioning, elevators, and track construction. Although coordinating with other companies was challenging, the project was successfully completed thanks to the cooperation of all stakeholders.

Station platform

## A Project Carrying Forward Various Thoughts and Aspirations

This project was a challenging one, but we successfully reached completion. In this long-term project lasting over 10 years, I, as the third-generation director, took on the large-scale excavation work on a busy main road, carrying forward the baton passed down from previous directors. We thoroughly enforced safety and quality management policies, overcoming challenges as a unified team, while also actively embracing the integration of the latest DX technologies. This achievement earned us the 2024 Japan Society of Civil Engineers Technology Award and the 2021 i-Construction Grand Prize, and I believe it marks a significant step in pioneering the future of the construction industry.

Yoshitane Satake
Project Manager

**Special Content 2 Health & Safety/Quality** Health & Safety

# Initiatives in Health & Safety

In production activities, safety is prioritized above all.
We aim to raise safety awareness across the entire Shimizu Group in our daily business activities, fostering a safety culture.

**By cultivating a safety culture, we protect the lives and health of workers and build the future of the construction industry.**

As a monozukuri-driven company, we strive for continuous growth by delivering safe, high-quality buildings and infrastructure that earn the trust of our clients and inspire society. To achieve this, we must uphold the basic principles of health and safety management—respect for human life and human beings—and work toward the complete elimination of occupational accidents through effective initiatives. With the introduction of overtime work limit regulations in April 2024, the construction industry has begun transforming into a more hopeful and appealing field, driven by greater efficiency, higher productivity, improved working conditions, and a shift toward a full five-day workweek. To build a brighter future for the construction industry, the entire Shimizu Group is committed to strengthening safety awareness, fostering a strong safety culture, and achieving the ideal of "Today's Work, Tomorrow's Heritage" with zero occupational accidents.

Taizo Tsukada
Managing Officer
Director, Safety & Environment Div.

## Challenges in the Construction Industry

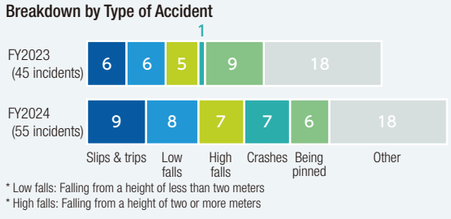
The number of fatalities from occupational accidents in the construction industry in Japan has decreased by 90% over the past 50 years since the implementation of the Industrial Safety and Health Act in 1972, but recently, the decline has slowed. Additionally, there has been an increase in occupational accidents due to factors such as physical decline associated with the aging of workers, acceptance of new entrants to the industry to address the labor shortage, and increasing natural disaster risks like heavy rain. The COVID-19 pandemic weakened communication, reduced safety management to a formality, and lowered risk sensitivity, resulting in serious accidents like falls, which must be urgently addressed.
Overseas, we are working on improving safety management levels similar to those in Japan, despite differences in regulations, safety awareness, and management methods. The Safety & Environment Division also visits local sites and engages in dialogue with staff to overcome site-specific challenges and improve overall safety management levels. Understanding the strengths and weaknesses unique to overseas sites provides valuable opportunities to discover areas for improvement in domestic safety management, enhancing both sides through mutual learning. Regardless of location, we will continue to foster a safety culture that prioritizes safety across the entire organization.

Dialogues between the Director of Safety & Environment Div. and local staff at an overseas worksite

## Accident Situation at Shimizu

In FY2024, there were six fatalities in total at Shimizu both in Japan and overseas due to occupational accidents, the highest in recent years. Furthermore, the number of incidents leading to more than four days of leave has increased, and we were far from meeting our KPI target of a frequency rate of 0.57, leaving significant challenges unresolved this year. Furthermore, according to the breakdown by type of accident, falls and collapses continue to be the most common types of incidents, and we are deeply concerned by the clear impact of safety management becoming a mere formality and the decline in risk sensitivity as contributing factors to these accidents.

**Breakdown by Type of Accident**




* Low falls: Falling from a height of less than two meters
* High falls: Falling from a height of two or more meters

## Health & Safety Promotion Conference

On June 17, 2025, just before National Safety Week, the Health & Safety Promotion Conference was held at the Main Hall of the Bunkyo Civic Hall, co-hosted with the National Federation Conference for Accident Prevention for Subcontractors. President called on all worksite stakeholders to adopt a sense of ownership, emphasizing the belief that protecting the lives and health of oneself and colleagues is crucial, and encouraged running the PDCA cycle with smooth communication. He also urged departments, worksites, business owners, and foremen to enhance the risk sensitivity of each worker and promote activities that encourage them to take ownership of accidents and disasters.


Health & Safety Promotion Conference was joined by about 1,800 participants

## President's Safety Patrol

At Shimizu, during the annual National Safety Week and National Occupational Health Week, the president and group-wide Safety & Environment Committee members carry out job site safety patrols. They review the progress of construction projects and assess the safety measures in place at job sites. In addition to making sure work procedures and basic rules are followed, they also remind workers to take thorough measures to prevent heatstroke. By speaking directly to the worksite stakeholders, we communicate the executives' personal commitment to respecting human life and the dignity of individuals. In 2025, they visited construction sites for building construction and civil engineering projects in Tokyo under the jurisdiction of the Tokyo Branch and the Tokyo Civil Engineering Branch.

President Shimmura visiting the construction site

## Opening of a Safety Dojo to Train Shimizu Safety Leaders

We have opened a safety dojo utilizing NOVARE and the Shimizu Takumi Training Center to train Shimizu Safety Leaders. This training differs from traditional classroom-based safety education, focusing on hands-on training to reform safety awareness and enhance risk sensitivity. The training has two main objectives: first, after completing the course, participants return to their work sites and apply what they have learned as Shimizu Safety Leaders to daily safety management activities. Next, participants are instilled with a strong sense of mission to build the future of safety themselves and contribute to developing the next generation of Shimizu Safety Leaders. We hope this training will greatly help improve the safety management levels at worksites.

Hands-on training at the Safety Dojo

## Kamewarigo Hands-On Training to Improve Risk Sensitivity

Recent reductions in occupational accidents have, paradoxically, led to decreased risk sensitivity among workers in the construction industry, hindering efforts to eliminate accidents. Since May 2020, the Risk Sensitivity Vehicle Kamewarigo has been in operation as part of our initiative to improve risk sensitivity. Over the past three years, we have conducted over 400 risk sensitivity training sessions at more than 150 worksites and partner companies, reaching about 7,000 participants. We will continue to travel nationwide to help make danger personal for workers.

"Kamewarigo" Mobile Safety Dojo

## Taking Ownership of Accidents and Disasters

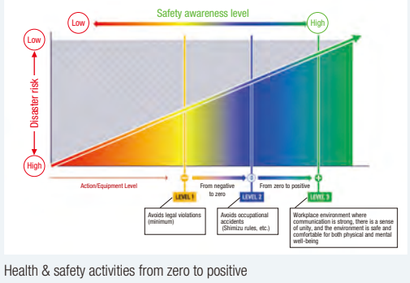
Through the promotion of activities aimed at taking ownership of accidents and disasters, we seek to reform the mindset of everyone working on the site. Occupational accidents are never someone else's issue. By recognizing accidents that occur at other sites as their own, each person takes proactive steps to reflect on the causes and preventive measures. The work group then establishes and acts on goals to prevent similar incidents, striving to improve risk sensitivity. Furthermore, during periods such as National Safety Week, we assess the implementation of taking ownership of accidents and disasters and work to standardize the approach by sharing successful examples across the organization.

Initiatives at the site

## Health & Safety Activities – From Zero to Positive

In collaboration with our subcontractors, we will continue to create a work environment that fosters well-being, based on strong principles and high-quality communication, while enhancing safety awareness and work engagement. Our goal is not only to follow laws and rules, but, as illustrated in the table on the right, to move from zero to positive, striving to achieve Level 3 in our health & safety activities, and continuing to deliver safety-conscious monozukuri to society and our clients.

**Initiatives in Health & Safety**
https://www.shimz.co.jp/en/company/csr/safety/




Health & safety activities from zero to positive

# Special Content 2 Health & Safety/Quality Quality

## Initiatives in Ensuring Quality

Quality is the foundation of our business.
As a manufacturing company with over 220 years of history,
our focus is on how we can meet the expectations of our clients and society.
We would like to share our commitment to Shimizu Quality.

### Achieving Shimizu Quality: Flawless Quality Management

Quality management means creating what is required, and the key is for each individual to take ownership, ensuring that there are no gaps in management. As the saying goes, “the site is a living thing,” and since conditions on-site change constantly, timely and flexible action is necessary. By returning to the fundamentals of monozukuri, we will thoroughly implement flawless quality management while ensuring quality through strong process management.
We will continue to value our core principles of “Customer First” and “Sincere Monozukuri (Craftsmanship),” and with passion and dedication, we will create Shimizu Quality through teamwork between the site, line staff, and our subcontractors.

## “Quality Day” Held as Part of Companywide Activities

As part of our efforts during Quality Month in 2024, we held a Quality Day event on November 1st at Shimizu Hall on the second floor of our headquarters. To protect quality, which is the foundation of our business, the goal was not only to pass down lessons learned from past defects but also to reassess the current state of quality management. During the event, the quality management departments newly established last October from each branch reported on their activities over the past year, and President Inoue (at the time) provided a closing review. The Quality Day event will serve as a catalyst for revitalizing our quality management activities and improving quality awareness among all employees.

A scene from Quality Day

## Quality Policy

We have established quality policies for our building Construction, civil engineering, and engineering businesses, to earn the trust and satisfaction of our clients.

### Building Construction Business

Shimizu provides technology and services clients trust and are satisfied with by accurately ascertaining the value clients expect, and manufacturing with optimal quality while maintaining with optimal quality while maintaining a dedication to quality by all employees through the entire process from sales to maintenance and preservation.

### Civil Engineering Business

All employees approach monozukuri (craftsmanship) with an attitude of humility and sincerity. They actively take personal responsibility for providing structures of outstanding quality that exceed the expectations of clients and society. This earns trust in and satisfaction with Shimizu as the continuing partner of choice and contributes to society.

### Engineering Business

By carefully integrating Shimizu’s expert technical skills into the process of fulfilling our customers’ needs, we build environments and buildings that offer exceptional value in terms of business potential, functionality, longevity, and regulatory compliance. We comply with the ISO 9001:2015 standard, the international standard for quality management systems, in accomplishing this and work to increase customer satisfaction and earn the trust of our customers.

## Initiatives in Each Business Division

### Building Construction Business

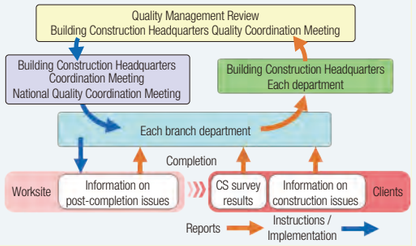
#### Preventive Quality Management through Branch Quality Management Department Inspections

To meet our clients’ needs, it is essential that each site consistently integrates our technology and expertise into the building while continuously following proper quality management processes. Our Quality Management System defines the fundamental processes related to construction, but in addition, the quality management departments at our branches perform site inspections and take necessary actions, such as providing guidance or temporarily halting work, based on actual operational conditions. With a third-party perspective, we systematically implement preventive quality management, which includes identifying risks as the construction progresses.


Branch Quality Management Department inspection

#### Ensuring Effective Report Lines and Prompt Internal Sharing of Quality-Related Information

Emerging quality issues are managed centrally using a dedicated system. All registered information is reviewed by the Quality Management Department in the Building Construction Planning Division and cross-checked with information from Sales. Based on the significance, it is reported to management as needed, and organizational responses are determined through monthly quality meetings. High-utility information is shared with operational staff, and as required, it is incorporated into company standards and related systems to continually enhance the overall quality level of the company.



Flow of reporting and deployment of quality-related information

### Civil Engineering Business

#### Providing Excellent Quality Based on a Proactive Approach to Monozukuri (Craftsmanship)

Civil engineering projects encompass many types of work, including dams, tunnels, bridges, and shields. In the Civil Engineering Business, we cultivate strong engineers with high technical skills, sound judgment, and broad knowledge through a variety of educational programs. Experienced engineers leverage the latest technologies to carry out their work.
Moreover, in civil engineering, we are committed to enhancing the construction process quality through organizational efforts, including the implementation and follow-up of quality management systems at each site by the construction departments, and technical support for quality issues and technical discussions by specialized departments. Additionally, heads of quality selected at each branch, in the role of acting branch directors, ensure there are no management issues within the organization, thereby preventing the recurrence of major past quality defects. Through these initiatives, we are dedicated to delivering high-quality structures that exceed our clients’ expectations.

#### Quality Conference – Ensuring We Never Forget Past Major Quality Issues

In the Civil Engineering Business, we hold the Quality Conference every year to commit to preventing the recurrence of past major quality defects and to ensure that we never forget them.
At last year's 20th edition of the conference, we re-emphasized the importance of the 20 conferences held so far, with the theme that everyone must take personal responsibility in preventing quality defects. All civil engineering staff across the company gathered to share this important message.

Award ceremony for the Concrete Structure Contest at the Quality Conference

### Engineering Business

#### Building in Quality That Earns Client Trust

We consistently build in and manage quality in accordance with an ISO 9001-compliant QMS for all phases of a project, from planning and design to construction and maintenance. By listening to client feedback and collaborating with internal and external project members, we leverage the collective strength of Shimizu to provide the optimal solution to meet our clients’ needs quickly. In addition to earning client trust, we aim to maximize the future value of our facilities.

**Quality and Customer Satisfaction**
https://www.shimz.co.jp/en/company/csr/quality/

## Special Content 3 Technology Development

# Cutting-Edge Technologies Supporting Safety and Quality

We are focused on technology development that combines high-quality manufacturing with improved productivity, creating value that exceeds society expectations.

**By addressing diverse social issues and anticipating future technological needs, we contribute to building a sustainable future society.**

With the increasing risks posed by climate change, such as wind and flood damage, the threat of major earthquakes, and social issues including the growing shortage of workers in the construction industry, technology development is needed to ensure the safety of communities and businesses against natural disasters, while combining high-quality manufacturing with productivity improvement. To address these challenges and other evolving social needs with speed, we have established a company-wide technology strategy, steadily applying developed technologies to real business operations, and engaging in cutting-edge research and development with a medium- to long-term view, all aimed at solving our clients' problems.

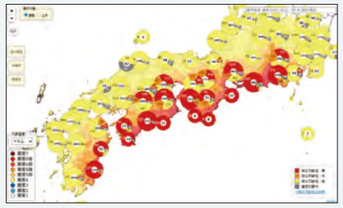
Shuji Kakegawa
Managing Officer
Director, Institute of Technology

## Ensuring Safety amid Natural Disasters

### BCP-Map* Supports Disaster Response Efforts by Estimating the Potential Damage to Building Complexes Immediately Following an Earthquake

Following a major earthquake, assessing and sharing information about the disaster across a wide area becomes extremely difficult. BCP-Map evaluates and aggregates the potential damage to building complexes within approximately 10 minutes of an earthquake, categorizing them as high, medium, or low risk. It assists disaster response efforts such as prioritizing response areas and optimally allocating relief supplies, speeding up and streamlining BCP response. This evaluation method was developed based on research conducted by Shimizu Corporation after the Great East Japan Earthquake, analyzing the damage to over a thousand buildings and their relationships with factors such as structure, number of floors, and year of design. In addition to aggregating and displaying data based on zooming and shrinking, the map, it also allows for searching and displaying the potential damage of individual buildings.

* BCP-Map is a registered trademark of Shimizu Corporation in Japan.

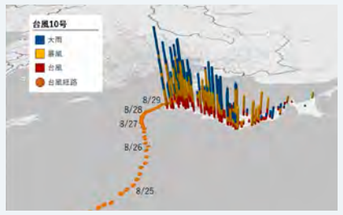


Evaluation and aggregation results based on the Cabinet Office's assumed earthquake intensity distribution for the Nankai Trough Earthquake

### Pinpoint-Timeline* Supports Pre-disaster Actions for Wind and Flood Damage

The Pinpoint-Timeline is a system that helps create and implement disaster prevention timelines, aiming to ensure safety and minimize damage in disaster-prone areas. Incorporating expert knowledge, the system makes it easy for disaster management personnel to create tailored timelines based on specific conditions and ensures they can reliably execute the timeline as a disaster approaches. Based on localized weather data and facility information, the system automatically notifies users of specific disaster prevention actions for a particular time and place. The progress of these measures can be shared with all relevant stakeholders, enabling quick and thorough disaster prevention actions.

* Pinpoint-Timeline is a registered trademark of Shimizu Corporation in Japan.




Alert notifications for nationwide construction site maintenance during approach of Typhoon No. 10 (Shanshan) in 2024

#### Message from the Pinpoint-Timeline developers

**Aiming to provide support for disaster prevention actions that are easy to understand and can be executed quickly by anyone**

Through four years of trial operations at sites nationwide, we have continuously refined the system. At smaller sites with limited staff, checking weather forecasts continuously can be challenging. However, this system allowed us to implement preventive measures in advance, and the positive feedback we've received has been very encouraging. In the future, we will expand the system's capabilities to offer flexible disaster prevention solutions tailored to different facility types and locations.

Institute of Technology
Center for Safety and Reliability Engineering
Disaster Resilience Grp.
(From left in the photo)
Masanobu Hasebe, Aya Saito, and Natsuki Hasegawa

## Ensuring Quality and Improving Productivity

### ACF Method* Reduces Overtime and Ensures High-Quality Concrete

The Advanced Concrete Finish method (ACF method) activates the cement hydration reaction (where cement reacts with water to harden) by adding admixtures to ready-mix concrete trucks on-site, allowing for precise control over the concrete's setting time.
By reducing the extended setting time of concrete in cold weather or regions, it frees workers from working late into the night and helps prevent issues such as bleeding (water accumulation after pouring) and surface cracking due to delayed setting, ultimately contributing to improved quality.
At the wind turbine foundation construction site, using this method for concrete work on inclined surfaces allowed us to start finishing work about one hour after pouring, cutting the work completion time by more than four hours compared to traditional methods. Furthermore, the risk of settlement cracking on the inclined surfaces, which is typically high, was greatly minimized.

* The Advanced Concrete Finish method (ACF method) was developed in collaboration with Denka Company Limited Additionally, the name of the method is a registered trademark of Shimizu Corporation in Japan.

The first application at Nakasato Wind Project (photo provided by Studio Quaria)

### Improving Productivity Through 3D Printing

**A Japan first** Applying Material Extrusion-Type 3D Printed Structures to Actual Construction

In 2020, we developed a fiber-reinforced cement composite material called LACTM* for practical use of construction 3D printing which contributes to improving productivity. We have since applied it to both architecture and civil engineering projects. In 2023, we developed a new version of LACTM, adding coarse aggregates to create Structural LACTM, which was first applied to a parking lot roof structure. In this project, we challenged ourselves to create arch-shaped beam components, placing rebar between the printed layers. The components with gradually changing cross-sections were directly printed by carefully controlling the nozzle speed. We also used Structural LACTM for the formwork of columns, reducing material usage and achieving a more rational design by minimizing member cross-sections. Structural LACTM is the first 3D printing material in Japan to receive certification from the Minister of Land, Infrastructure, Transport and Tourism. It offers performance equal to or greater than traditional concrete and can be used for primary building structures. This certification allows it to be used without the need for individual ministerial approvals, broadening the scope of 3D printing applications.

* LACTM is a registered trademark of Shimizu Corporation in Japan.

Parking lot roof structure (Smart Innovation Ecosystem NOVARE)

**A Japan first** On-Site Construction of Structural Components with Material Jetting 3D Printers

In 2024, we developed a new 3D printing technique that uses compressed air to spray cement-based materials through a nozzle to create 3D shapes. With this method, we can directly construct components that match or exceed the structural performance of conventional reinforced concrete by spraying the printed material around pre-placed rebar.
In October 2024, we applied this technology on a real project, directly constructing 2-meter-high column component with a 0.4 $m^2$ cross-sectional area on-site. The time required from material spraying to surface finishing was 2 hours and 50 minutes per unit. Using this approach, we confirmed about a 40% reduction in construction time compared to traditional methods, which require concrete pouring, formwork assembly, and scaffolding. Additionally, the absence of wooden formwork helps to reduce environmental impact.

Construction at Nippon Steel Corporation's Setouchi Works, Hanshin Area (Sakai)

#### Message from the 3D printing developers

**Revolutionizing construction sites with 3D printing**

Since 2018, we've been developing and implementing this technology in real-world projects. This innovation is expected to address the construction industry's skilled labor shortages and environmental challenges, creating new value as a transformative tool. We remain committed to further advancements and social implementation to deliver even greater value.

Institute of Technology
Center for Social System Engineering
Infrastructure Engineering Grp.
(From left in the photo)
Ryu Kikuchi, Shinya Yamamoto, Hiroki Ogura, and Hiroyuki Abe

**Institute of Technology**
https://www.shimz.co.jp/en/company/about/sit/