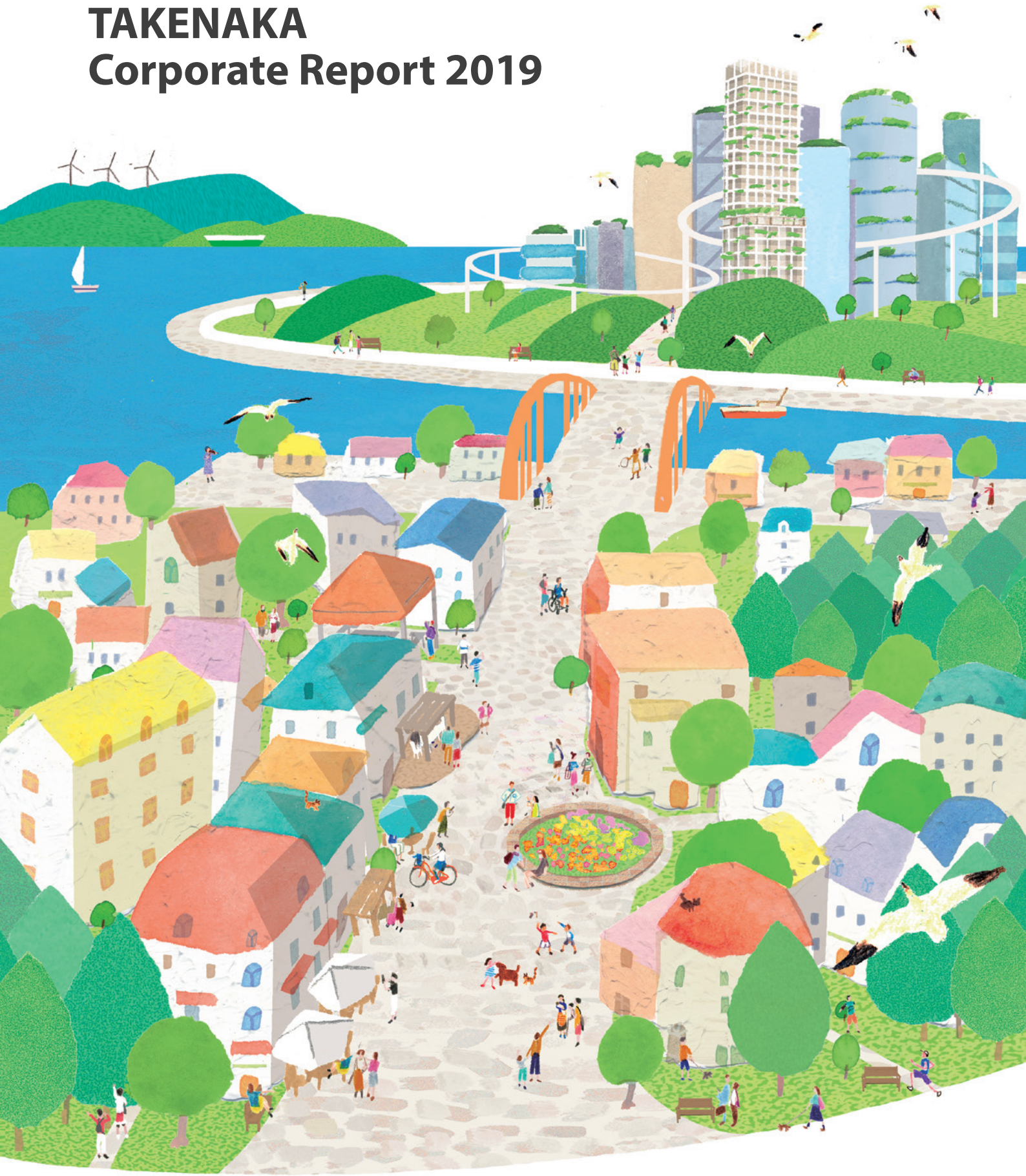
TAKENAKA
Corporate Report 2019



TAKENAKA

TAKENAKA

We will inform all of our stakeholders through our report and website about the operations and initiatives that the Takenaka Group is pursuing with the aim of realizing a sustainable society.

Editorial policy

We have compiled this Takenaka Corporate Report 2019 for the purpose of presenting the Takenaka Group CSR Vision and describing the projects undertaken by our corporate group as a whole with maximum clarity. Its contents primarily comprise details related to activities conducted by Takenaka Corporation. Contents, case examples and data that cannot be covered in the report due to space constraints will be featured on the Takenaka Corporation website. This report integrates our corporate brochure (introductory overview of our businesses) and sustainability report (CSR activity report), which were formerly issued as separate publications. It also seeks to obtain the full understanding of our stakeholders by incorporating our medium-term management plan as well as our principal financial and nonfinancial data in order to present the business operations implemented by our group on a global scale.

Corporate Website
(Japanese/English)
www.takenaka.co.jp

- Major Works
- Solutions
- Corporate Information
- CSR Activities

Corporate Publications (Japanese/English)

Corporate Report
(Japanese/English)

Major Works Report
(Parallel Japanese/English)

Financial Report
(English)

Financial and nonfinancial information concerning the company is presented in an integrated, compact format.
Its business operations and results (works) are introduced in greater detail.

*Separate technology and solutions publications are also available.

The report provides detailed coverage of financial and nonfinancial information across a wide range.

Period of coverage
January–December 2018. Some contents concern activities conducted outside this period.

Scope of coverage
The contents include the activities of the Takenaka Group centered on the activities of Takenaka Corporation.

Reference guidelines
Environmental Reporting Guidelines, 2012 the Ministry of the Environment, and the Japan Standards Association's draft translation, ISO26000 (Guidance on Social Responsibility), 1st edition, November 1, 2010, were employed as references in compiling this report.

Date of issue
April 2019 (next issue April 2020).
We have also published this report on our website to make it available to larger numbers of readers.

Inquiries
Public Relations Department
Tel: 81-3-6810-5140

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Honorary Chairman

Chairman
Masahiro Miyashita

President
Masato Sasaki

Seeking realization of a sustainable society

Since the founding of our business, we have consistently provided architectural structures that respond to the expectations of our customers based on our management philosophy, “Contribute to society by passing on the best works to future generations.”
The role that corporations are called on to play in society changes with the times. Today they are being asked to contribute to solving large numbers of problems confronting our world on a global scale, including such issues as climate change and overpopulation. As we wish to maintain a sensitivity to change at all times, we will continue our ongoing dialog with people everywhere and our diligent efforts to improve our technologies with the aim of providing optimal solutions to meet the needs of the era. By leveraging the strengths of our entire corporate group, we will contribute to urban creation by building cities and towns where people can live in safety and security, and to achieving a sustainable society with the goal of establishing a path to a better future for the earth.

April 2019

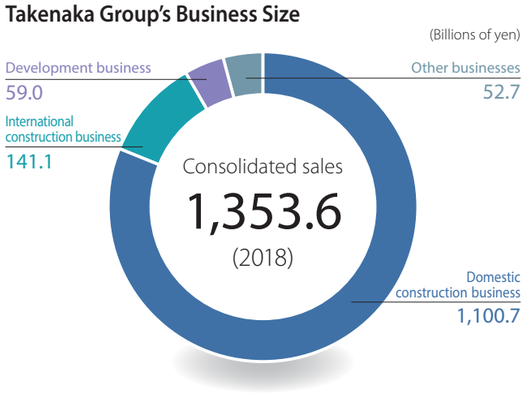
“Urban Creation” with prosperity and peace of mind

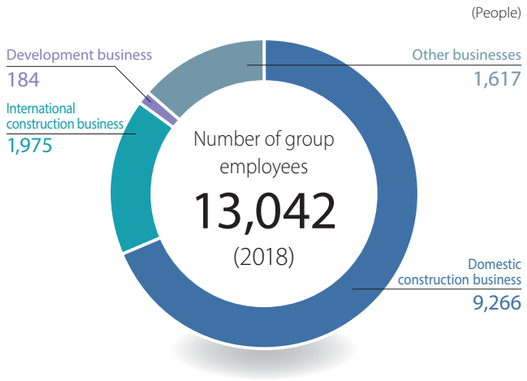
Architectural firms such as ours are required to meet constantly changing challenges. These include preparing for natural disasters, dealing with limits imposed on us by environmental and energy issues, developing more stable and abundant national lands, fostering regional revitalization, and constructing cities and infrastructure around the world. Meanwhile, cities and buildings are expected to fulfill even more sophisticated and diversified functions in today’s era of changing lifestyles and corporate activities, where companies are increasingly globalizing their operations and ICT is developing in dramatic ways as demonstrated by AI and big data.
Being a company engaged in the construction industry, we believe that it is our responsibility to properly meet the needs of modern society, and to continue to satisfy continual expectations for safety and security in an honest and reliable manner. As we celebrate the 120th anniversary of our company founding in 2019, we will persist in our pursuit of "Takenaka Quality Management (TQM)" based on our corporate philosophy, which is the cornerstone of our business. We remain committed to promoting activities that contribute to a sustainable society through “urban creation” with prosperity and peace of mind, thereby continuing to enable people to lead happy, fulfilling lives.

April 2019

Working as a group to satisfy customer expectations at every stage of urban creation

Takenaka Group's Business Size





Principle Operations of Main Affiliates

Takenaka Corporation

Planning and Design | Architectural Design | Production | After-Sale Service

Development Business and Other Businesses

Technological Development and Engineering

Domestic Affiliates

Architectural Design	Construction Planning, Estimation/Procurement	Construction	Facility Management
TAK Systems Corporation (CAD)	TAK-QS Corporation (Quantity surveying)	Asahi Build Corporation (Reinforced concrete and formwork) Tokyo Asahi Build Corporation (Reinforced concrete and formwork) TAK E-HVAC Corporation (MEP) TAK Living Corporation (Millwork, interior designs and interior finishing) Asahi Corporation (Interior and exterior finishings, construction materials, and greening)	Asahi Facilities Inc. (Building management)

Civil Engineering Business

Takenaka Civil Engineering & Construction Co., Ltd. (Civil engineering works) — Takenaka Road Construction Co., Ltd. (Road construction)

Resort and Hotel Operation

Urabandai Kogen Hotel

Others

Create Life Corporation (Employee welfare programs)
TAK Capital Service Inc. (Finance and accounting services)
Asahi Facilities Inc. (Insurance agency)
TAK Engineering Inc. (Staffing agency)
TAK Systems Corporation (ICT)

Overseas Affiliates

Construction Business

Thai Takenaka International Ltd. — PT. Takenaka Indonesia — Takenaka (Malaysia) Sdn. Bhd. — Takenaka India Private Ltd.
Takenaka Vietnam Co., Ltd. — Takenaka (China) Construction Co., Ltd. — Takenaka Europe GmbH — Takenaka Corporation (U.S.A.)

Investment and Development Business

TAK Development, Inc. (New York, San Francisco)
TAK Realty UK Ltd (London)
TAK California, Inc. (San Francisco)
TAK Hawaii, Inc. (Hawaii)
TAK Realty NY, Inc. (New York)

Takenaka Corporation Corporate Data

Company Name	Takenaka Corporation
Head Office	1-13, 4-chome, Hommachi, Chuo-ku, Osaka, Japan
Capital	¥50 billion (as of March 31, 2019)
Construction Licenses	Ministry of Land, Infrastructure and Transport Construction License (Special-26, Special-28) No. 2744 (General-26) No. 2744
Number of Employees	7,500 (as of January 1, 2019)
Affiliates	49 subsidiaries, 15 affiliates, and 1 related company
License Holders	Licensed first-class architects.....2,466 Licensed first-class building works execution managers.....2,337 Licensed professional engineers .....185 Ph.D.s.....120 (as of January 1, 2019)

Main Businesses	1. Undertaking, design, and supervision of architectural and civil engineering works 2. Studies, research, surveys, planning, evaluation, diagnosis, and other engineering and management services for construction, regional and urban development, ocean development, space development, energy supply, environmental preservation, and other projects 3. Land preparation and housing construction 4. Sales and purchasing, leasing, brokerage, maintenance, management, and appraisal of real estate as well as real estate investment management
Main Banks	MUFG Bank, Ltd. Sumitomo Mitsui Banking Corporation Mizuho Bank, Ltd. Resona Bank, Ltd. Mitsubishi UFJ Trust and Banking Corporation Sumitomo Mitsui Trust Bank, Ltd., others

Corporate Organization (as of April 1, 2019)

General Meeting of Shareholders
Board of Corporate Auditors
Board of Directors
President
Executive Vice Presidents

Head Office

- Audit Department
- Secretarial Department
- **Planning**
  - Corporate Strategic Planning Department
  - Public Relations Department
  - CSR Promotion Department
  - TQM Promotion Department
  - Group ICT Promotion Department
  - Subsidiaries & Affiliates Department
  - Urban Creation Strategy Department
- **Management**
  - General Affairs Department
  - Legal Affairs Department
  - Personnel Department
  - Finance & Accounting Department
- **Technological Development**
  - Technology Department
  - Research & Development Institute
- **Marketing**
  - Marketing Department
    - Marketing
    - Healthcare & Educational Facilities Department
  - Project Development Department
  - PPP/PFI Promotion Department
  - Engineering Department
    - Environmental Engineering Department
    - ICT Engineering Department
    - Manufacturing & Logistics Engineering Department
    - Power Engineering Department
    - Advanced Structural Engineering Department
    - Wooden Architecture Promotion Department
  - Facility Management Department
  - Smart Community Promotion Department
  - BIM Promotion Department
- **Design**
  - Design Department
    - Workplace Produce Department
    - Advanced Design Department
- **Construction**
  - Construction Department
  - Procurement Department
  - Safety & Environment Department

Main/Branch Offices

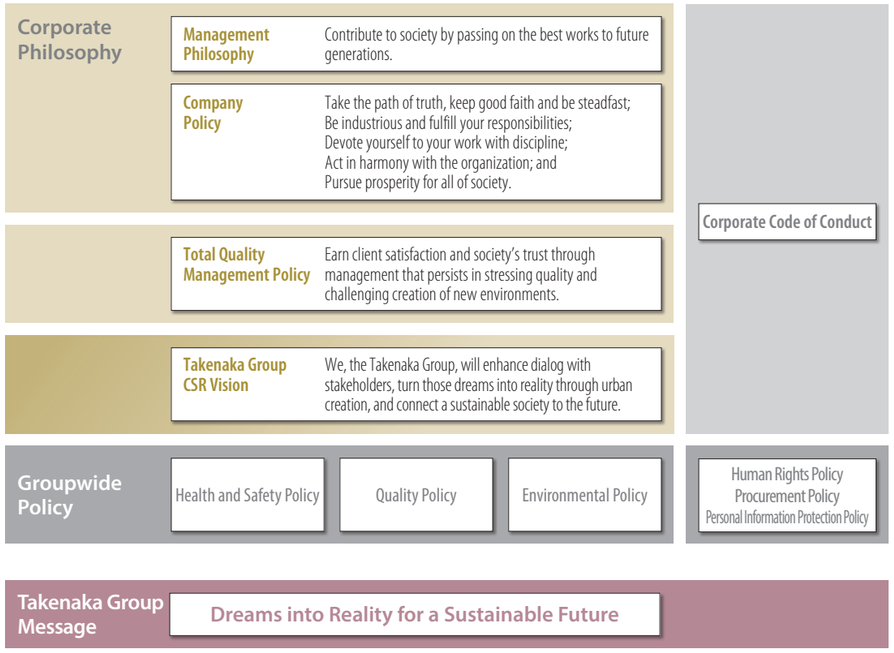
- Hokkaido Branch Office
- Tohoku Branch Office
- Tokyo Main Office
- Yokohama Branch Office
- Higashi Kanto Branch Office
- Kita Kanto Branch Office
- Nagoya Branch Office
- Osaka Main Office
- Kyoto Branch Office
- Kobe Branch Office
- Shikoku Branch Office
- Hiroshima Branch Office
- Kyushu Branch Office
- International Department
- Investment and Development Department
- Osaka Station North District Development Department
- Metropolitan Area Project Development Department
- Yumeshima Development Department
  - 2025 Japan World Expo Promotion Yumeshima Development Department
  - MICE/IR Promotion Yumeshima Development Department

Main Branches
- Construction Project Offices
- Area Facility Management Centers
- Regional Branches

Standard Main Office Organization
- General Affairs Department
- Accounting Department
- Personnel Department
- Business Promotion Department
- Facility Management Department
- Design Department
- Estimate Department
- Procurement Department
- Cost Control Department
- Construction Engineering Department
- Mechanical & Electrical Engineering Department
- Construction Document Department
- Safety & Environment Department
- Quality Department
- Residential Service Center
- Engineering Depot

Dreams into Reality for a Sustainable Future

We consider our management philosophy, "Contribute to society by passing on the best works to future generations," to be our corporate mission.
To achieve it we follow our company policy and handle every architectural project we undertake with the utmost care. This ensures quality management, which earns customer satisfaction and society's trust, and raises the company's value to society. More than ever before, we are required to engage in many activities that share our corporate values with society as stakeholders diversify and the functions of architecture change. Moreover, society is facing various problems, such as global warming and climate change, safety and security, an aging social infrastructure, and a declining birthrate and aging population. The potential impact of these issues requires today's corporations to shoulder more social responsibility. Accordingly, we formulated the Takenaka Group CSR Vision and the Takenaka Group Message, which incorporate this vision in communicating our corporate philosophy based on a concept of quality management, to express our commitment to deploying our group's concerted efforts and cooperating more closely with stakeholders and society to resolve social issues and realize a sustainable society. Each Takenaka employee will take our corporate philosophy, the cornerstone of our business, to heart and promote quality management in accordance with the CSR Activity Guidelines presented in our corporate code of conduct in order to realize this vision.



Realizing the combined aspirations of the Takenaka Group CSR Vision and Takenaka Group Message

Besides responding to the expectations of our stakeholders, who include the global environment, local communities, customers, employees and partner companies in our efforts to realize a sustainable society, we believe that the cities in which they all gather and pursue their various activities must be safe, prosperous and easy to live in both today and tomorrow. To assure this, we will enhance our dialog with stakeholders even further. We will combine the business capabilities of our corporate group in construction, civil engineering, real estate and development, facility management and urban renewal in order to realize a sustainable society of the future through urban creation with new added value.

Activities to achieve our business vision

In response to stakeholder expectations, we are promoting awareness of world trends, including SDGs, definition of issues through continual dialog with stakeholders in various fields of activities, and establishment of management initiatives that support these while maintaining consistency with our corporate code of conduct. By steadily advancing these efforts, we will continue to resolve a variety of social issues and contribute to the realization of a sustainable society through urban creation.

Management supporting fields of activity in which the aspirations of stakeholders are fulfilled to provide a legacy for the future

Takenaka, the Past

Since its founding in 1610, Takenaka has specialized in architecture to produce a multitude of buildings that have become landmarks, and in this way we have played a vital role in the development of our society.
Architecture creates vessels to protect life and property that are at the same time social assets. They carry the culture of their times and pass it on to future generations. The pride inherent in such work permits us to refer to the buildings we are involved with as architectural "works." We have participated in major projects that deeply affect Japan's society, economy, and culture, and we have delivered a great number of these works and related engineering and technological developments to the world.
Our philosophy of always placing our customers' dreams first and maintaining high technological levels as an architectural specialist lives on from the days of our founder Tobei-Masataka Takenaka, who was a master builder of shrines and temples. Today this spirit is embodied in a variety of works, not only in Japan, but all over the world.

1610

1610
Tobei-Masataka Takenaka establishes a business in Nagoya to engage in shrine and temple construction.

1901

1874
Nagoya Garrison barracks featuring Western-style architecture adapted to the postrestoration era completed.

1884
Mitsui Bank Nagoya branch completed.

1897
Mitsui Spinning Mill completed in Nagoya.

1899
14th-generation head of family Touemon Takenaka journeyed to Kobe, which marked the first year of the company's foundation.

1900
Mitsui Bank Warehouse completed in Onohama district of Kobe.

1909
Unlimited Partnership Takenaka Komuten established with headquarters in Kobe and a branch in Nagoya.

1912
Takashimaya Kyoto Store completed as Japan's first retail store building.

1916
Osaka Asahi Shimbun Head Office Building, a steel reinforced concrete structure, completed.

1934
Meiji Seimeikan (Marunouchi, Tokyo) completed.

1937
Takenaka Corporation established. Capital ¥1,500,000.

1941

1960
Takenaka & Associates, Inc. established in San Francisco, starting full overseas business operations.

1941
Takenaka Civil Engineering & Construction Co., Ltd. established.

1957
Antarctic Exploration Research Facilities produced.
Patent acquired for Takenaka Caisson Construction Method.

1958
333-meter high **Tokyo Tower** completed.

1961

1973
Takenaka Europe GmbH established, expanding business into Europe.

1974
Thai Takenaka International Ltd., PT. Takenaka Indonesia, and **Takenaka Corporation Singapore Office** established, expanding business into Southeast Asia.

1978 West Germany
Deutsch-Japanisches Center completed.

1963
Takenaka awarded first prize in **National Theatre** Design Competition.

1969
Asahi Facilities, Inc. established, expanding our building management and insurance businesses.

1979
Takenaka awarded Deming Application Prize.
Ashiyahama Seaside Town, proposed by the ASTM Group, of which Takenaka was a member, completed.

1981

1981 Singapore
Changi International Airport Terminal 1 completed.

1990
Takenaka (Malaysia) Sdn. Bhd. established.

1983 Tokyo
Ote Center Building completed and opened.

1987 San Francisco
Hotel Nikko San Francisco completed and opened.

1990 Osaka
Crystal Tower completed and opened.

1986
Takenaka awarded Best Design Prize in **New National Theatre, Tokyo** International Design Competition.

1987
Yurakucho Marion completed.

1988
Chairman Renichi Takenaka awarded the Deming Prize.
Tokyo Dome, Japan's first multipurpose stadium with an air-supported membrane structure completed.

1991

1993
PT. Takenaka Doboku Indonesia established.

1996 Thailand
Bank of Ayudhya Head Office Building completed.

1991 Hawaii
Grand Hyatt Kauai Resort and Spa completed and opened.

1992
Takenaka awarded the Japan Quality Control Medal.

1993
FUKUOKA YAHUOKU! DOME, Japan's first multipurpose stadium with a retractable roof, completed.

1997
Nagoya Dome completed.

2001

2001
Takenaka Corporation (U.S.A.) established.

2003
Takenaka (China) Construction Co., Ltd. established.

2003 Germany
Hyundai Motor Europe R&D Center completed.

2010
Takenaka India Private Ltd. established.

2001
Oita Sports Park Oita Bank Dome and Sapporo Dome completed.

2006
World's tallest superhigh-rise base-isolation condominium **City Tower Nishi-Umeda** completed.

2007
Chubu region's tallest skyscraper **Midland Square** completed.
Large-scale integrated **Tokyo Midtown** and **Shin-Marunouchi Building** completed in central Tokyo.

2008
World's first high-rise condominium comprising three interconnected skyscrapers, **Island Tower Sky Club**, completed.

2009
Mitsubishi Ichigokan and **Marunouchi Park Building** completed.

2011

2015 Singapore
CapitaGreen awarded the CTBUH 2015 Best Tall Building Award for the Asia & Australia Region.

2017
Takenaka Vietnam Co., Ltd. established.

2017 Singapore
Changi International Airport Terminal 4 completed, to handle the flow of people and economic activities as Southeast Asia's hub airport.

2017 Indonesia
Pacific Century Place Jakarta completed and distinguished for outstanding environmental features with LEED Platinum certification.

2013
ABENO HARUKAS completed, the tallest building in Japan, in a high-density urban environment.
Grand Front Osaka completed and opened as a large-scale "city" connected directly to the railway station.

2014
Takenaka awarded Architectural Institute of Japan Award (Architectural Design) for **Meiji Yasuda Life Insurance New Toyocho Building**.

2017
Global Gate complex opened to serve as the core of Sasashima Live 24, the redevelopment project targeted as an international center for exchange and interaction with foreign visitors.

International Operations → P25
Development → P27
Architecture → P21

Takenaka "into the Future"

We will provide the services and solutions that the times demand, and while adhering to our master builder spirit, works principle and integrated design-build system, the "works" we handle will transcend architecture and extend to "urban creation." We will continue to live up to the trust society has placed in us and contribute to prosperous "urban creation" by pursuing the best for everyone from a long-term perspective.

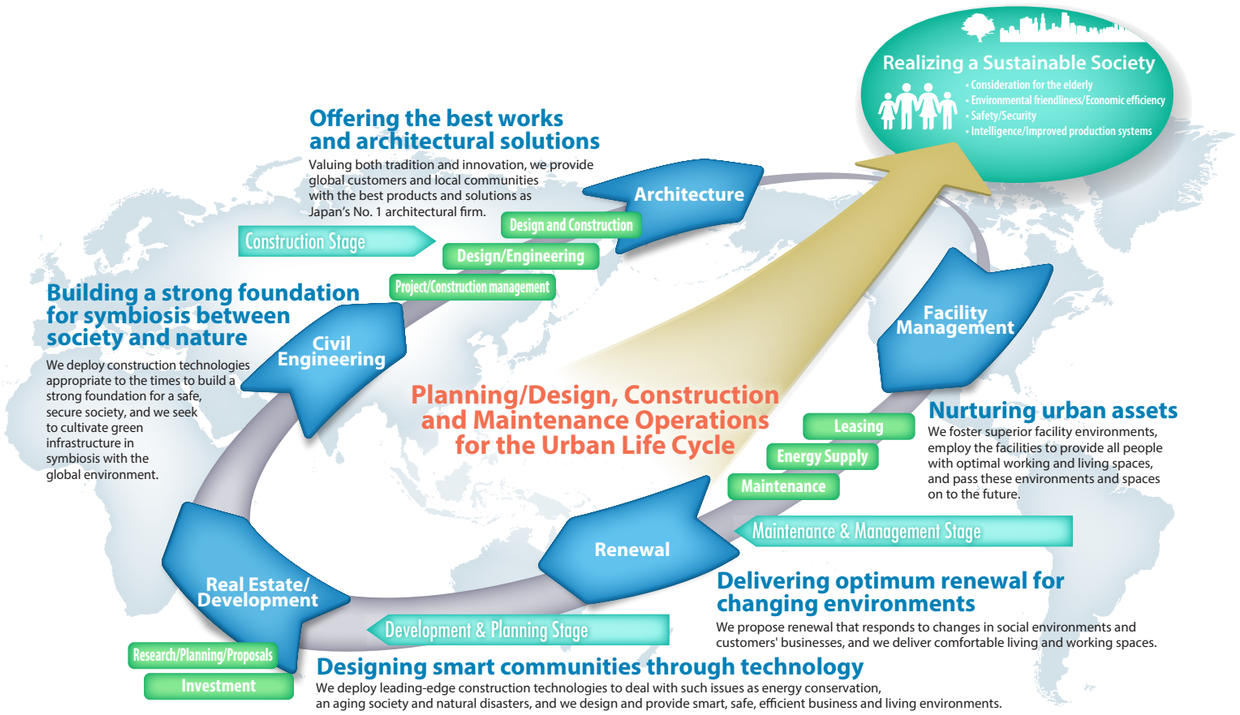
We seek to provide the best solutions for our customers' business activities in order to contribute to the realization of a sustainable society through the concerted efforts of our entire group.

Masato Sasaki
President

Group Growth Strategy for 2025

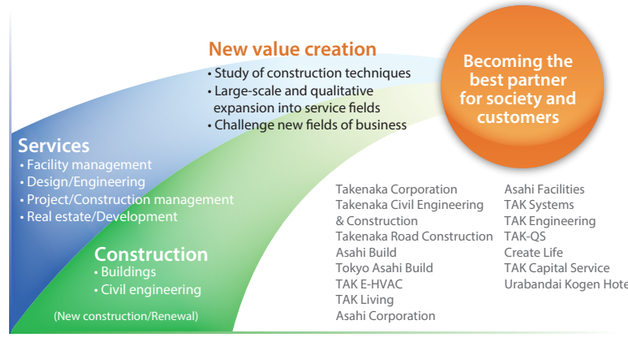
Participation as a group in urban creation on a global scale

We at the Takenaka Group have been conducting activities by treating groupwide areas of business as "cities." Throughout every stage of urban creation and throughout the life cycle of these cities from planning and design to construction, maintenance and operation, we will continue to deepen dialog with our stakeholders and work to meet various challenges both in Japan and abroad based on close collaboration among all our group companies. We will do this with an eye to realizing a sustainable society where people can live with peace of mind.



New value creation

Contributing "throughout every stage of urban creation" requires pursuing activities with close collaboration among Takenaka Group companies and stakeholders in the peripheral areas of construction projects. In our rapidly changing society, even better stock and business continuity need to be secured. The expansion of PPP, PFI and other projects, acceleration of measures for renewable energy, and AI, robots and big data are exerting tremendous influence over urban creation, substantially changing the very roles played by buildings and infrastructure. We intend to establish ourselves as the best partner for society and our customers by providing new value through new solutions realized by a fusion of architectural technologies and services.



Steps toward growth

All our group members will work in unison to provide society and our customers with new value through individual efforts by each of us to refine the quality of our specialized technologies and services on a path toward growth. In STEP 1, we sought to promote collaboration among our group companies and improve our revenue base to enhance our production capabilities, thereby building the basis for urban creation. Based on these results, we will steadily strive for progress toward 2025 with a collective groupwide effort to promote activities in STEP 2 that provide value to society.

Review of last year and activities to be conducted toward the next step

This year, 2019, is the final year of our three-year plan (STEP 2) that commenced last year. In STEP 2, we set a target for clarifying the Takenaka Group's vision by developing a clear picture of the kind of sustainable society the Group Growth Strategy for 2025 is aiming for. We will work hard to be "No.1" in the architectural industry, valuing both tradition and innovation. To that end, we have created environmentally friendly sustainable works and accelerated efforts to achieve radical improvement in companywide productivity and work-life balance (WLB).
Last year, which was the second year of the plan, we expanded activities throughout the company, which were centered on the "Work-Life Balance Committee for Radical Productivity Improvements Companywide." After formulating "11 Work-Life Balance Promotion Measures," we implemented various initiatives, such as holding dialogs at all offices, activities for model workplaces promoting work-life balance and for two-day weekends at district FM centers, and review of management meetings.
We also attempted further productivity improvements through labor-saving construction by promotion of BIM (building information modeling) and smart work, etc.
In terms of business performance, we were mostly able to achieve our targets with a robust domestic construction market in the background.
This year, which is the final year of the three-year plan, falls on the commemorative 120th anniversary of our company. In addition to efforts to improve work-life balance, which is the top priority issue, we plan to improve our ability to offer new value to customers and society through attractive work styles. In the construction business, which forms the core of the Takenaka Group's business, we plan to eliminate all serious public disasters and workplace accidents while at the same time continue to work toward creating the best works. To contribute to every stage of urban creation, which is the Group Growth Strategy, we are introducing new ways of promoting our urban creation business and offering solutions to social issues, which will create new value globally across our group.

Promoting urban creation aiming for a sustainable society

For the sustainable society we are seeking to realize in and after 2025, we will further improve our international competitiveness and the "compact city + network" plan to help stop population decline, create new jobs, and foster local revitalization.
It is assumed that social issues to be solved, social systems to be built, and paths for conversion to a sustainable society will differ greatly from city to city. As such, the Takenaka Group will deepen its dialog with the community and stakeholders in each urban area while taking a global perspective and communicating the creative direction in its "urban creation strategies," thereby contributing to the creation of sustainable urban areas.
Based on these urban creation strategies, we will add new solutions to the construction business as an "integrated engineering firm for urban creation" from the viewpoints of "urban infrastructure," "economy and culture," "quality of life (QOL)" and "the future" to create new business models while designing necessary social systems. In doing so, we will create value that we can share with society.
We will expand our managerial resources including human resources, skills and ICT to exert more expertise as well as technological and managerial capabilities, drive open innovation, and promote the provision of attractive workplaces as well as the establishment of functions and organizational systems with advanced engineering capabilities.

Business Scope of the Integrated Engineering Firm for Urban Creation

Society level — Dialog with stakeholders — Urban area level

Sustainable urban areas to be realized

Infrastructure that strongly supports enriched and diverse lifestyles, and industries
- Leading-edge information infrastructure and security provided with perfect disaster management
- Development of traffic and logistic networks to support people's lives and industrial growth
- Smart communities based on the use of highly efficient renewable energy

Cities and communities where local tradition and characteristics are revitalized and experienced
- Development of local industries and cultures to be a wellspring for Japan's competitiveness
- Ensuring the natural capital and living infrastructure of rural areas
- Cities that give unique cultural messages

Places where people can lead diverse and healthy life, work and learning styles
- Exchange of a range of people based on diversity
- International center featuring advanced education and open innovation
- Enhancement of childcare and education systems for a brighter future
- Safe and peaceful living supported by health, welfare and medical services

Pioneering the future by taking on ambitious and unprecedented challenges
- Creating the future through cross-field collaboration using advanced technologies

Takenaka Group's urban creation

Business model and solutions to realize a sustainable society

Urban creation strategies ×

— Our expertise —

Design urban infrastructure
Urban planning | Area/town management | Compact city + network | Infrastructure | Traffic | Stock | Information/ ICT
Energy | ZEB | Nature restoration and conservation | Biodiversity | Resource circulation | Safety and security

Design economy and culture
Manufacturing and transportation | Agriculture, forestry and fisheries | Industrial promotion | Tourism and commerce | Inbound | Tradition and culture

Design quality of life (QOL)
Living | Work style | Health & longevity | Community | Education and research | Welfare and living support

Design the future
Advanced technology | Frontier | Big data | AI and robotics | Wood structures

Developing an urban creation strategy and future prospects

As an integrated engineering firm for urban creation, we identify social needs that alter with the changing times and issues faced by society and local communities so that we can offer new value in construction and suggestions for further value creation.
In 2017, we performed analysis and problem arrangement of issues with urban areas from the viewpoint of geographical location and population. Then, we communicated with stakeholders through this department, which is the core organization of the Takenaka Group's urban creation business, to identify social issues in urban areas.
By conducting open innovation such as demonstration experiments through dialog with stakeholders, we will advance MACHIinonovation (Matinonovation), which explores and practices methods for solving problems.

Efforts in urban areas

Our Tokyo Main Office, which is located in an urban area, set three steps to work on urban creation, "hypothesis planning" → "demonstration experiments based on these hypotheses" → "social implementation. It then concentrated its efforts on putting forth a futuristic vision, "East Bay Concept," in the canal and bay areas of Koto Ward where urban creation of coastal areas is expected on the occasion of the 2020 Olympic Games.
In the 2018 example of this case, we held a workshop caravan involving residents and companies called "A meeting that entertains the local waterfront" and began to build a network in the area. We will continue to develop activities such as symposiums in the future.

Regional initiatives

The first step in development of regional communities is gathering knowledge of the community's characteristics, problems and other current conditions. For this purpose, we had the opportunity for direct dialog with heads of local governments and employees, persons involved in local community development activities and local residents in Nichinan City, Miyazaki Prefecture, Unnan City, Shimane Prefecture, Nishiawakura-mura, Okayama Prefecture and Kamaishi City, Iwate Prefecture. This was done in coordination with ETIC, which is a top NPO in the field of regional revitalization and resolving social problems.
In the course of sharing various issues, we started to work together with relevant parties in Unnan City on a comprehensive campaign for local community development, which was named "Special Challenge for Opening the Future of Unnan."

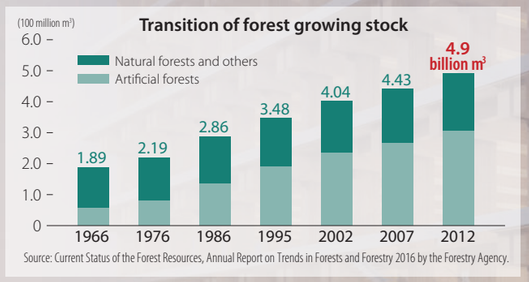
Increasing the Number of Mid-Rise Buildings Made of Japanese Timber

Takenaka is furthering urban creation that realizes a low-carbon society and fosters regional revitalization by promoting the use of Japanese timber in various projects and by applying our innovative technologies. Working to build a sustainable society that links forests and cities by constructing wooden buildings in urban areas, we are utilizing CLT structural techniques and advanced timber construction technologies, including Moen-Wood, which is our exclusive fire-resistant laminated lumber.

1 Constructing wooden buildings in urban areas

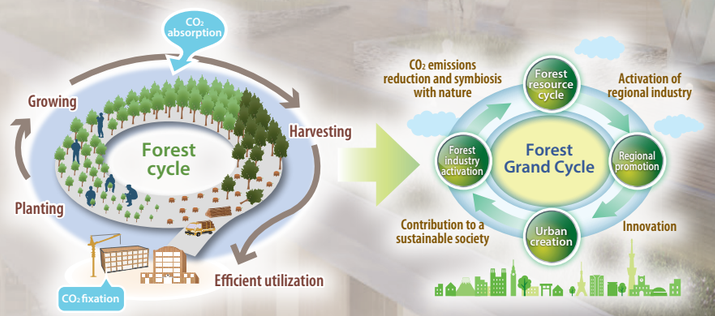
Forested areas occupy approximately two-thirds of Japan's land area. As 40 percent of these forests were planted soon after World War II, forestry resources available for cutting have increased five times over the last 50 years, suggesting that these artificial forests in Japan are now ready for full use. At the same time, however, the forestry industry is experiencing a range of problems, such as a decreasing number of forestry workers and prolonged low demand for domestic timber.
For this reason, invigoration of the forestry industry and promotion of domestic timber usage have been set as priority policies in Japan's regional revitalization, and the construction market is accordingly making a considerable shift toward active usage of domestic timber. Forest resource utilization, which is a renewable resource with low-carbon emissions, has also been incorporated into the CO_2 emissions reduction scenario of COP21.*1

*1 COP21: An international conference to tackle global warming. Member states signed an agreement to achieve targets to reduce greenhouse gas emissions by 2030.



Source: Current Status of the Forest Resources, Annual Report on Trends in Forests and Forestry 2016 by the Forestry Agency.

Since olden times, Japanese people have lived with forests throughout the cycle of planting, growing, and usage. Takenaka has presented a concept of the Forest Grand Cycle, in which the traditional relationship between human beings and forests is enhanced to become a relationship between urban life and forests. Our aim is to establish this grand cycle through building cities that contain resources from forests. By constructing buildings made with wood in place of steel and concrete, we can encourage the cycle of resources, industry, and economy that connects cities and regional areas.



Increasing the number of wooden buildings in urban areas can increase the volume of CO_2 fixation and newly planted trees can encourage CO_2 absorption. Through the Forest Grand Cycle, we are aiming for a large-scale cycle of resources and economy that connects forests and human society beyond the traditional forestry cycle.

INTERVIEW

Mr. Shintaro Tajima
The TAJIMAFOREST CORP.
CHAIRMAN

I am very pleased to have this opportunity to be able to work with Takenaka Corporation in cultivating forests and revitalizing mountainous and regional areas by constructing wooden buildings in Sendai, Miyagi Prefecture that utilize timber* produced in Oita Prefecture. We will look after the new forests, where we planted trees together at a tree planting ceremony. We hope that we can continue constructing wooden buildings as our landmarks for the "Future with Trees" and the "Forest Grand Cycle."
(* Timber is partially used in construction.)

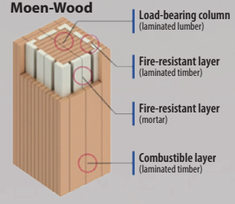
2 Development of structural technology for mid-rise wooden buildings

Replacing the concrete and steel frames used to form mid-rise buildings with timber requires great efforts to deliver the same capabilities as concrete and steel, such as aseismatic performance, compliance with fire and disaster safety regulations, and procurement of high-quality robust materials. In 2011, we developed a fire-resistant laminated lumber, Moen-Wood (patented) with a fire-resistance capability of up to one hour,*2 and since then, we have utilized the material in a number of buildings designed for different purposes.
Moen-Wood boasts a highly fire-resistant performance yet it has a surface quality that can confidently be used for exposed finishes. In addition to Moen-Wood, we have been developing a range of technologies—including building techniques specialized for Cross Laminated Timber (CLT)—in order to build mid-rise wooden buildings in urban areas.

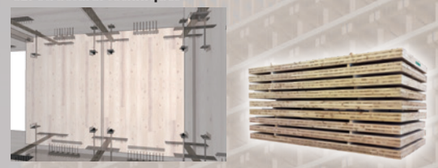
*2 One-hour fire-resistance capability: According to the Certificate of Fireproof Construction by the Minister of Land, Infrastructure, Transport and Tourism (one-hour fire resistance).

In the PARK WOOD TAKAMORI, two-hour fire-resistant Moen-Wood is used for columns, and CLTs are used for floors and walls.

Fire-resistant laminated lumber, Moen-Wood

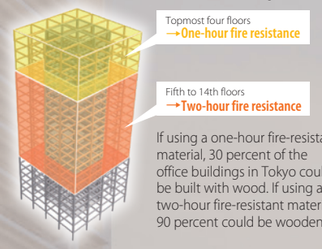


CLT structural techniques



Cross Laminated Timber (CLT) is a large, thick wooden panel commonly used in the construction of mid-rise wooden buildings in Europe and the US.

Number of stories and fire-resistance specifications



If using a one-hour fire-resistant material, 30 percent of the office buildings in Tokyo could be built with wood. If using a two-hour fire-resistant material, 90 percent could be wooden.

Major wooden building projects

Following our first wooden building project, the Osaka Timber Association Building, built in 2013, the number of large-scale wooden or wood-based buildings that we have built in urban areas now exceeds 10. Timber is now used in a variety of buildings, including an office building, a commercial facility, a school and a clinic.

Osaka Timber Association Building (2013)

Shinkashiwa Clinic (2016)

KOTO Ariakenishi Gakuen (2018)

Takenaka Training Center "Takumi" (2018)

3 Aiming for taller wooden buildings

The PARK WOOD TAKAMORI completed in February 2019 was a project to build Japan's first 10-story hybrid wooden structure*3 using CLTs and Moen-Wood. The two-hour fire-resistance technology utilized in this project could replace a large part of existing buildings in Tokyo with wooden buildings. Alta Ligna Tower is a model high-rise wooden building designed with a range of our fire-resistance and wooden construction technologies. This design enables the construction of a high-rise wooden building as seen in Europe, while fulfilling the strict earthquake- and fire-resistant requirements specified in Japan. A 12-story apartment in which some of the Alta Ligna Tower technologies are used will be completed in 2020.

*3 Hybrid wooden structure: A building structure that uses a combination of wood and steel/reinforced concrete as the main frame.

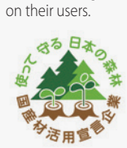
2018~2019
PARK WOOD TAKAMORI
10-story building

2018~2020
FLATS WOODS KIBA
12-story building

~2025
Alta Ligna Tower
20-story building

Promotion of wooden material usage

Takenaka is pursing a variety of action toward the further usage of domestic timber. In 2018, Takenaka became Japan's first general contractor certified as an enterprise declaring its active utilization of domestic timber. Moen-Wood can be made of trees from different parts of Japan, such as cedar, larch, and cypress, and it has been certified to bear the Domestic Wood Mark. We complied with the Act on Promoting the Distribution and Use of Legally Harvested Wood as we actively utilized such wood in the PARK WOOD TAKAMORI. With the aim of designing wooden structural spaces based on a scientific understanding, we are also conducting research on the psychological and physiological effects from the comforting nature of wooden buildings on their users.



Takenaka is certified as an enterprise declaring its active utilization of domestic timber under an association of six organizations spanning forest owners, the forestry industry, and the lumber industry.

Research on psychological and physiological influences on human beings from wooden structures (conducted at Shinkashiwa Clinic)

Background: Roof installation of the Ariake Arena sports facility using the "Traveling Method"

Innovating Productivity of the Entire Process from Design to Construction

The decrease in the number of skilled construction workers and improvements to the work-life balance of workers are pressing issues to be addressed in order to reinforce the construction industry's sustainability. To this end, we need to achieve unprecedented productivity improvements by innovating the entire building process from design to construction with the help of the latest ICT technologies, including Building Information Modeling (BIM),*1 AI, and robotics. As a constructor who manages the entire construction process in an integrated manner, we are actively working on productivity improvements throughout every stage of the process.

*1 Building Information Modeling (BIM): Technology to represent a 3D digital model of a building.

1 Incorporating building information from the design stage

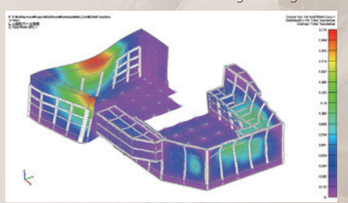
Having inherited the spirit of a master builder, Takenaka has nurtured its integrated design-build system from sales to after service. In the process from design to production, we have established a front-loading system where not only construction departments but also partner companies participate from the design stage. Utilizing this method, we are able to not only offer design plans and a schedule with minimum alterations in the later stages but also incorporate building information, such as construction methods and structural fabrication drawings from the earliest stages of the construction process. This streamlines the entire construction procedure, enabling efficient project planning, improved work-life balance of workers, enhanced quality, labor savings, and reduction of environmental impact.

Birds-eye-view of the underground work utilizing an existing building frame

Lean undergound work utilizing existing buildings

In undergound work that involves dismantling an existing building, the positions of the existing building and the new building frame*2, and the order of construction, determine the construction period and costs. In a project to rebuild the PARCO store in Shibuya, Tokyo into the new PARCO Udagawa-Cho Building Complex, we undertook the following research and incorporated the results into the building design. Firstly, we made a 3D stability analysis of the outer wall of the existing building in order to use it as a brace*3 to hold the surrounding ground. Secondly, we carefully studied the scope of the new frames to be built while at the same time dismantling the old building. With this method, we were able to reduce the materials and labor allocated to building the soil brace.

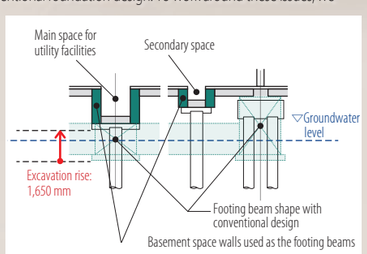
*2 Frame: Base structure of the building.
*3 Brace: Walls and joists built to support the surrounding ground during excavation.



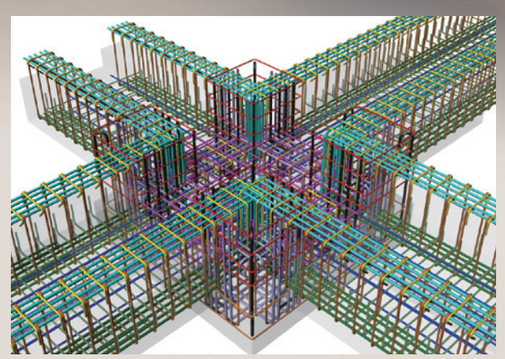
3D stability analysis results of the existing wall

Foundation design with minimum groundwater influence

When we built a large exhibition hall in Tokoname, Aichi Prefecture, we discovered that the groundwater level in the construction area was quite close to the surface. Thus, we anticipated that costs to drain water during excavation would be high and construction efficiency would be significantly low if we used a conventional foundation design. To work around these issues, we constructed the wall of the basement space to be used for pipes and ducts as the footing beams so that the bottom of the excavation area remained higher than the groundwater level. Further, we successfully reduced labor requirements by utilizing BIM to study frame distribution and create construction units based on a life-size model.



Shallow excavation by utilizing the basement space walls as the footing beams



Frame distribution and unit modeling using BIM

2 Evolution of production BIM and application to fabrication

BIM has been used to retain consistency among structural and facility models. It then evolved to integrate frame and production models into the design stage. Finally, it grew into software to provide digital fabrication data that connects models to enable factory production of steel frames, precut*4 pipes, and light gauge steel joists*5 To make better use of BIM by reinforcing the connections between design and the production model, we established a Production Department last year to promote front-loading in the construction process.

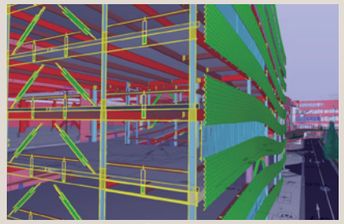
*4 Precut: Cutting materials at a factory before delivering them to the work site.
*5 Light gauge steel joists: Joists used inside walls and ceilings on which panels are mounted.

Linking design models and production models

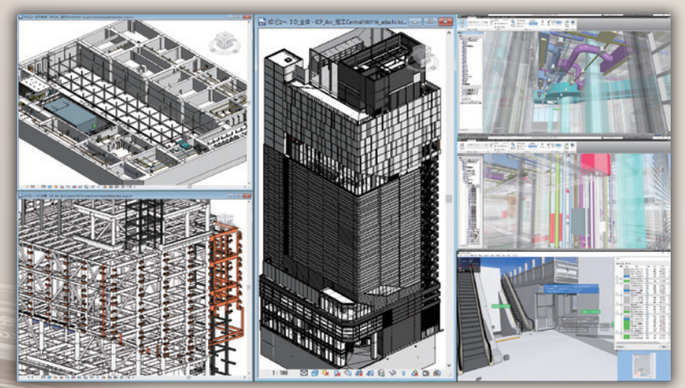
In our project to build Ikebukuro Cinema Complex in Tokyo, we created structural models, frame models, and exterior models in an integrated manner by linking detailed design models, collaborating with the Product Department and partner companies from an early stage. One of the factors to be taken into account in building a cinema is delivery of large screens, and this was also simulated using precision modeling. When we commenced the actual construction, the nearly-complete major working drawings and the on-site construction plan were already available. In the future, we will continue to improve construction efficiency by utilizing BIM in building design.

Enhancing digital fabrication usage

We were commissioned to build Nichia Corporation's new factory building, K-6, in Tokushima Prefecture, and the MARK IS Fukuoka Momochi store in Fukuoka Prefecture based on a third-party design. Utilizing digital fabrication techniques, we assessed component fitting details in the early stage by using exterior and interior models, and transferred the resulting digital data to factory machines to produce light gauge steel joists and exterior panels. This successfully reduced production labor and on-site work.



Exterior fitting simulation model



Detailed design, and the integrated structure and exterior BIM model

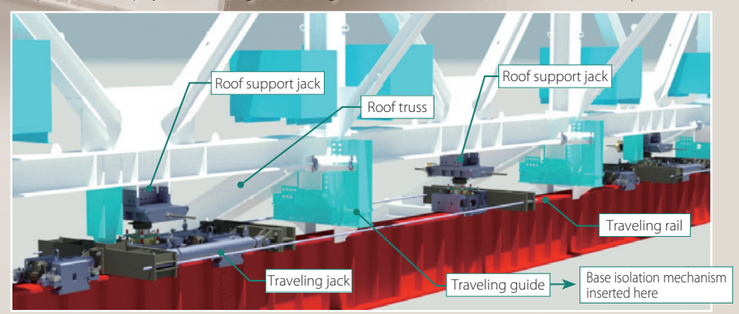
3 Development of robotic and automated construction methods, and trial usage of AI

Takenaka has developed a range of automated construction methods. Such methods include the Traveling Construction Method, in which a part of the structure (e.g., the roof) is built and laid out as a component with the working point travelling across the foundation beams (the method used with Yokohama Arena); and the Lift-Up Construction Method, through which the roof and other building components are built on the ground and raised to the destination floor (the method used with Nagoya Dome). At Ariake Arena, we are attempting the first base-isolated roof structure through our traveling method, which is also achieving significant labor savings. We are also undertaking research on productivity improvements through utilization of advanced technologies such as running an open innovation project for trial usage of a walking robot at construction sites, development of AI software that supports construction plan management, and gathering information on startup IT companies.

Development of a traveling mechanism for base-isolated roofs

In the Ariake Arena project, construction of the roof that covers a large area was a critical phase*6 within the overall construction. We therefore designed the construction process on the premise of using the Traveling Construction Method for roofing. However, as the roof is designed to include a base-isolated structure, we needed to prepare a traveling mechanism that would not hinder the base-isolation components. To achieve this, we built a new traveling mechanism containing the roof support jacks and multiple jacks for traveling, which would not obstruct these components, as well as a system to control the columns. The results were significant labor savings and enhanced safety.

*6 Critical phase: The most important stage that determines the rest of the construction process.



Traveling mechanism for base-isolated roof construction (patent pending)

Technological innovation featuring robots and AI

Buildings are generally tailor-made and each of them has a different shape. Therefore, robots are required to have highly accurate sensors and be adaptable to a variety of situations. Together with two other companies*7, Takenaka has been conducting demonstration tests using SpotMini, made by Boston Dynamics with the aim of contributing to improving productivity and construction efficiency. We are also developing a structural analysis AI application, and we have enhanced opportunities for open innovation projects with startup IT companies in Silicon Valley.

*7 Two other companies: Softbank Robotics Corporation and Softbank Corporation

SpotMini by Boston Dynamics

Dreams into Reality for a Sustainable Future – "Work Style Reform"

As the Japanese population is aging along with a declining birthrate, efforts for work style reforms promoted by the Japanese government are accelerating with the aim of realizing a society where everyone can be dynamically engaged in labor. In particular, taking into account that long working hours are habitual in the construction industry, Takenaka is giving the highest priority to improving the work-life balance (WLB) among its employees by implementing work style reforms. We will continue to create an attractive construction company with business sustainability by drawing out a clear vision of our own future, together with stakeholders, and conducting activities to encourage the motivation of each one of our employees.

Eleven Measures to Promote Work-Life Balance (main points) and their implementation progress

(1) Review human resources management (labor regulations, etc.)
Publishing total working hours on our website, introduction of a flexible working hour system that suits different working environments, and introduction of an hourly-based time-off system.

(2) Restructure organizations, systems, business flows, and distribution of human resources.
Revision of items subject to individual discretion and associated maximum expenses, revision of meeting arrangement criteria, including management meetings, and reduction of stock and usage of paper.

(3) Establish new working styles at construction project offices.
Improvement of productivity, work style surveys, propagation of good practices, and publishing an e-mail magazine to introduce promotional cases.

(4) Find solutions to individual work problems within each department.

(5) Restructure workplaces.
Implementing communication tools and promoting their usage, and setting up satellite offices and touchdown offices.

(6) Set productivity indexes.
Setting up companywide productivity indexes and indexes per job classification. Disseminating an understanding of labor productivity and intellectual productivity.

(7) Reinforce management skills.

(8) Communicate our aim to build a culture of reform inside and outside the company.
Running a website dedicated to WLB topics, planning and holding related lectures and workshops, and organizing intracompany dialogs.

(9) Circulate information to customers and seek their cooperation.

(10) Plan and support diverse working styles for skilled workers.
Enhancing the Meister Program, promotion of enrollment in the career advancement system, and support for the transfer from daily payments to monthly payments.

(11) Encourage employee initiatives and teamwork.

Companywide workplace dialogs for better working styles

Since 2017, workplace dialogs have been held across the company by a dedicated committee, led by the president. In these dialogs, employees in various positions exchanged opinions on how to improve both labor and intellectual productivity, reduce working hours, encourage employees to take holidays, care for children and the elderly, gain the understanding of stakeholders, and other work-related topics to encourage diverse styles of working.
We are also actively trying out different schemes, including off-peak hour commuting for construction site workers, introducing a guidebook of construction site arrangements for female workers, teleworking via mobile PCs, and labor reduction through Robotic Process Automation (RPA).
As for closure of construction sites, we are sharing effective practices suggested by different workplaces in order to streamline working styles. Aiming at realizing a scheme in which workplaces are closed for six days in every four-week period (six days off every four weeks for renovation) by 2019, we will further promote fair working practices through labor reduction with advanced technologies and seek the understanding of stakeholders.


Scene of workplace dialog

Ideal work style for employees and the company

We share the concept of an ideal work style for employees and the company and are working together to realize it.

"Sustainable LIFESTYLE" poster encouraging us to make efforts in all our offices.

Sustainable LIFESTYLE

Aim for us and the company with our stakeholders
- Use your own time and your coworkers' time carefully.
- Enjoy healthy and rewarding lives.
- Grow together with the company.

Initiatives Taken by Employees and the Company
- Improve labor productivity and intellectual productivity to provide added value to society.
- Increase unity in the workplace while valuing individual aspirations.
- Appeal to stakeholders for our way of working.

Attractive Construction Industry for a Sustainable Future

1 Improving the working environment

To change working styles, we will innovate the working process and methods in each process of design, construction, maintenance and management.

(1) Workplace reform

Following completion of the Mido Building Innovation Space Seibi (MISS) renovation project at the Osaka Main Office in December 2017, we continued our office renovations to encourage the emergence of innovation, including the 2018 Tokyo Main Office Innovation project, as well as reform of the Nagoya Branch Ofice and the Takenaka Research and Development Institute. We also started reconstruction of Fukae Chikuyu Dormitory, converting it into a place to nurture employees to be "new future creators."


Meeting space Hirameki


The KOMOREBI office lounge with greenery

(2) Trial of new working support system

We are revising our working systems to enable effective working styles for our diverse human resources, such as reforming the substitute day off system by allowing more flexible periods and time units, and a trial of off-peak commuting at appropriate construction project offices.

(3) Fostering a new work style culture

Our WLB improvement activities are often misunderstood as the mere reduction of overtime hours. To enable individual employees to understand what it really means and put this understanding into practice, we are holding a number of lectures and workshops delivered by external speakers.


Lecture by external speaker

Analysis of motivating moments at work

2 Dialogs with stakeholders

Customers, design offices, partner companies… These are important stakeholders for us as a general contractor, and we must promote their understanding of our business. We are visiting customers and design offices to present a leaflet of our Basic Policy on the Two-Day Weekend, published by the Japan Federation of Construction Contractors (JFCC) in order to gain understanding of construction process planning that incorporates appropriate working hours. At the same time, we are gathering opinions from constructuion workers at partner companies through various dialogs and feeding back their opinions into our activities.


Dialog with partner companies

3 Implementing new working styles

Each employee is actively trying out new working styles by using cutting-edge ICT equipment and reborn workplaces. The fresh insights that they have gained as a result of trial and error are then shared across the company through various media to become a part of our collective knowledge.

(1) Utilization of ICT and new office facilities

Our newly renovated offices allow employees to work more freely with mobile PCs and communication tools like Skype. They are now able to work in locations they choose, depending upon their work, and are liberated from the conventional restrictive and fixed manners of working. The meeting booth (nicknamed the "Family Restaurant Seats") installed in the cocreation space is used as a point for ad-hoc meetings and a point for innovative activities.


Mobile PC


Family Restaurant Seats

(2) Trial of new working system

We have commenced trials of teleworking in some offices to assess its efficacy in helping those employees also engaged in childcare and elderly care. We are expanding the options for working styles., such as by offering a working environment where people can manage their job and childcare with the help of a corporate childcare service.


Children's playroom inside a construction project office

(3) Expansion of new working styles

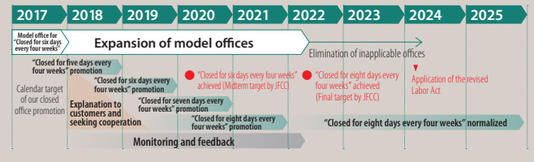
Overviews and the progress status of the WLB measures being implemented in different workplaces are published through our internal website to share these ideas with employees across the company. Additionally, a range of effective practices carried out by individuals is disseminated via our e-mail magazine.


WLB website

4 Realizing WLB

To improve WLB in construction project offices, we promote Saturday site closures through the following schedule.

Schedule overview (In renovation projects, "closed" means day off)



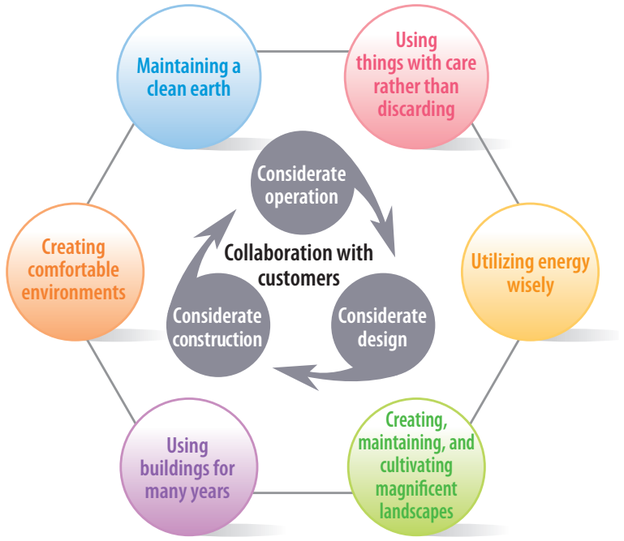
Productivity enhancement	Design that takes into account productivity, and utilization of BIM and the latest mobile technologies
System/Business process	Reforming the HR system and reviewing business processes
Explanation to customers and seeking their understanding	Explanation of the closing of the construction site Saturday
Partner companies and skilled workers	Improvement of labor productivity (elimination of inefficiency)

Turning Customer Dreams into Reality

The functions required of buildings today are becoming sophisticated and diverse. Environmental considerations are a given, but facilities must also be safe and secure as well as strong. We are also taking up the challenge of creating new architectural value with emphasis from a perspective of being of "people friendly."

Sustainable works

Our advocacy of "sustainable works" refers to "activities aimed at creating architectural spaces that are in harmony with the environment in collaboration with our customers." We have adopted this approach to architecture in order to pass on a sustainable society to future generations and as a means of helping customers, who desire to contribute to the global environment and society, and to turn their dreams into reality. We have devised various methods for "earth-friendly thinking (design)" and "earth-friendly creation (construction)" to enable our customers to have "earth-friendly usage (operation)." We assess every aspect of our activities with respect to design, construction, and operation from the six perspectives described on the right in close communication with our customers.



Global Gate

—Creating a new high-rise urban complex—

Design/Construction: Takenaka Corporation (2017)

The plot for the Global Gate office and leisure complex is located 800 meters to the south of the Nagoya railway station. The area was used as Sasashima station for freight trains belonging to Japanese National Railways until 1986. The area was then designated as a redevelopment zone to build a new business hub named "Sasashima Live 24 Area" that would feature convenient access to Nagoya station. Located in the center of this area, Global Gate is a large-scale complex planned as the main initiative project to embody the concept of Environmental Capital Nagoya. The new building contributes to urban renewal and functions as a communications hub with a CO_2 emissions reduction design. This is a new communications center in Nagoya, bustling with hotel guests and conference center attendees from inside and outside Japan, and visitors to the commercial facility area, which is attractively laid out with lush verdure.

Gate City in concert with the Nakagawa Canal restoration

In the south side of the area is the terminal (anchorage) of the Nakagawa Canal, which is reminiscent of bygone days at the height of water transportation between the 1930s and 1960s.

Based on Nagoya City's Nakagawa Canal Restoration Plan, this previous anchorage has been transformed into a canal walk with a boat dock. Water transportation that connects the area to Kinjo Pier in Nagoya Port has also been restarted. Global Gate is composed of the West Tower (170 meters) and the East Tower (88 meters). Between the two towers, there is a wind path that accommodates commercial facilities and features plentiful greenery. The entire complex is designed to appear as a symbolic gate towering above the regenerated historic canal.

When designing the new complex, we anticipated that we would not be able to create an area bustling with people simply by putting together spaces for different purposes. We therefore made careful structural arrangements, such as creating an approach to the stores from the outer square that flows into the space between the two towers like an inlet, and a roof garden at the foot of the two towers to create another ground level to guide people in walking about. Such a layout creates a flow of people and points where they gather, thereby generating a lively feel in this urban area.

Creating comfortable environments

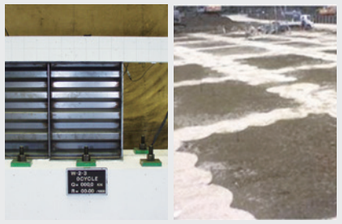
Façade panel with heat controller for office comfort

The temperature of these office rooms is partially controlled by confining hot or cold air between the window and the blind. The blind is semitransparent so that people can see outside even when the blinds are closed, thereby reducing any feeling of confinement. The precast metal pilasters that cover the building exterior have a ventilation slit to enable intake of air in spring and autumn. Integrated with an environmental control function, the design minimizes air conditioner operations, saving energy spent in controlling the temperature throughout the whole year.

Using buildings for many years

Broadband vibration absorber and TOFT

In the building core of the West Tower (170 meters), corrugated steel plate aseizmatic walls were installed. Combined with viscoelastic dampers, these plates effectively absorb a wide range of seismic waves (broadband vibration). In addition, constructing a building on ground reinforced with our Grid-Form Ground Improvement Method (TOFT) improves the aseismatic performance of the entire building foundation, thereby preventing the building from sinking even if the soil liquefies during an earthquake.



Creating, maintaining, and cultivating magnificent landscapes

Roof garden generating a place for people to gather

The commercial facility area of Global Gate has a roof garden open to the public where anyone can freely stroll. The design approach to the garden is to offer a feeling of exploration by guiding people to it naturally when they ascend the stairs that are randomly placed inside the commercial facilities. Featuring a "hands-on" vegetable garden and a large staircase that can also be used as a stage for different events, we aimed to create a space where people could always find something enjoyable every time they visit.

Utilizing energy wisely

Utilization of the DHC system

Global Gate uses cool and hot water, and steam provided by a district heating and cooling (DHC) system installed in the area. Hot water and exhaust heat from steam are used by a desiccant air-conditioning system installed in the commercial facilities, and for prewarming of hot water supply for the hotel and stores. In addition, industrial water, which is less processed and therefore consumes less energy than drinking water, is used for nondrinking purposes, such as toilet water and garden watering. In the same way, rainwater collected in the area is stored and used for nonpotable purposes.

Using things with care rather than discarding

Recycling precast concrete frames as hallway decorations

We had used precast concrete frames with wood texture for the exterior of the commercial facilities. These frames were then recycled as ceiling design in the communal hallway. The frames, which had a burned texture of wood grain, were used as they were after some surface cleaning. The ceiling is one of the ecologically advanced features of this building, in addition to the green-oriented design concept of the commercial facility area.

Maintaining a clean earth

Reducing construction sludge

During ground improvement, heavy equipment will be set up above ground with excavation work done from the ground surface to the actual ground improvement level. As Global Gate has a two-floor basement, approximately 13-meter-high waste soil was expected to be generated, so we created a slope to bring in the heavy machinery and carry out the excavated sludge. We then set up the heavy machinery close to the bottom level of the building foundation. Through this method, we managed to significantly reduce the amount of waste soil.

Turning Customer Dreams into Reality

Design born from our comprehensive capabilities

Pacific Century Place Jakarta, located in the SCBD area of central Jakarta, is a superhigh-rise office building designed to create value that is "timeless and unique" to vie against intense real estate competition taking place in an ever-changing urban environment amid rapid economic development.
The layers of fins on the façade made of highly transparent glass bring distinctive changes to a simple façade composition by adapting actively to the regional environment, including marked thickness on the east and west surfaces to block sunlight in the horizontal direction.
On the office floors there is a curtain wall system that creates a sense of openness with large Low-E glass measuring 3.6 meters by 2.25 meters. The 10.8-meter-wide span, created by CFT structural columns and installed for the first time in Jakarta, creates a functional and attractive workspace.
The building's outstanding environmental performance, which is proven with LEED Platinum certification, and BCP measures, which provide 36-hour full load backup, enhance its real estate value.
This superhigh-rise building, with outstanding added value and made possible through our comprehensive capabilities and cutting-edge technologies, has become a flagship in Jakarta's real estate market.

Pacific Century Place Jakarta

—TIMELESS AND UNIQUE—

Design Architect: Takenaka Corporation
Architect: PDW Structural Engineer: GISTAMA MEP Engineer: ASDI
Construction: PT. Takenaka Indonesia, PT. Total Bangun Persada Joint Opereation (2017)

Fins that have been designed to be thicker on the east and west sides to block the strong horizontal sunshine that is distinctive of a tropical climate add an uniqueness to the simple façade design.

The large unit curtain wall with its outstanding environmental performance has created a workspace with a sense of openness and an outstanding view.

The transparent glass screen and louvers that continue out to the exterior helped create an entrance lobby with an ambience of openness that is integrated with the landscape.

Attractive renewal

Buildings, which are essentially receptacles that protect our lives and possessions, are transformed into social assets over time. Our concept of "attractive renewal" refers not only to recovering the functionality and beauty characterizing architectural structures at the time of their original construction, but it also extends to adding new functions to raise their asset value and improve their business operability. At the same time, another concept, "from scrap and build to stock utilization," which was formulated from the perspective of environmental conservation and sustainability, is becoming increasingly widespread today.
The functions sought in architecture are also diversifying and growing in sophistication.
This means going beyond improvement of basic building functions and performance that no longer meet the needs of the times to include preserving buildings of historical significance while utilizing them efficiently by implementing changes in their functions (conversion) that create new value. The design and technological capabilities Takenaka has developed over many years are being deployed for "attractive renewal," for which we have received high acclaim, including in the form of awards from the Building and Equipment Long-Life Cycle Association (BELCA).

kudan house

The former Mankichi Yamaguchi residence located in Kudankita, Chiyoda-ku, Tokyo, is a Spanish-style mansion completed in 1927. This historical building was restored to preserve its heritage. We participated in the restoration project and managed the formerly privately-owned property into a membership-based business innovation site. Through this "legacy utilization project," which is aimed at the preservation and effective use of historic structures while paying due attention to economic viability, we are contributing to the creation of a sustainable society.

National Registered Tangible Cultural Properties (2018)
Renovation design: Takenaka Corporation
Renovation construction: Tokyo riken. Co., Ltd. (2018)

Tsutenkaku

This project represents the world's first seismic retrofitting of a steel tower building by a mid-story isolation method. While ensuring safety against large earthquakes, we aimed to convey a message from the past to the future by preserving the outer appearance of this registered tangible cultural asset as well as by reproducing the painting on the ceiling of the first Tsutenkaku building.

Diffusion Award at the 17th Japan Society of Seismic Isolation (JSSI) Awards
Prize at the 50th Japan Sign Design Association (SDA) Awards
Award in the Long Life Category at the 27th BELCA Awards

Renovation design and renovation construction: Takenaka Corporation (2015)

MOA Museum of Art

This is a 35-year-old art museum that stands on a hill overlooking Sagami Bay. Without touching the original exterior made of Indian sandstone, we completely renewed the building with an emphasis on the original features of the lobby and exhibition rooms. In the exhibition rooms, we utilized recycled timber and black plaster, which have typically been difficult to use in museums, to rejuvenate the viewing space but keep it suitable for exhibiting antique artworks.

Award at the 24th BCS Awards
Award in the Long Life Category at the 13th BELCA Awards
Award in the Best Renovation Category at the 28th BELCA Awards

Basic renovation design and design supervision: New Material Research Laboratory (NMRL)
Partial basic renovation design, final design, construction: Takenaka Corporation (2016)

Supporting the Business Activities of Our Customers

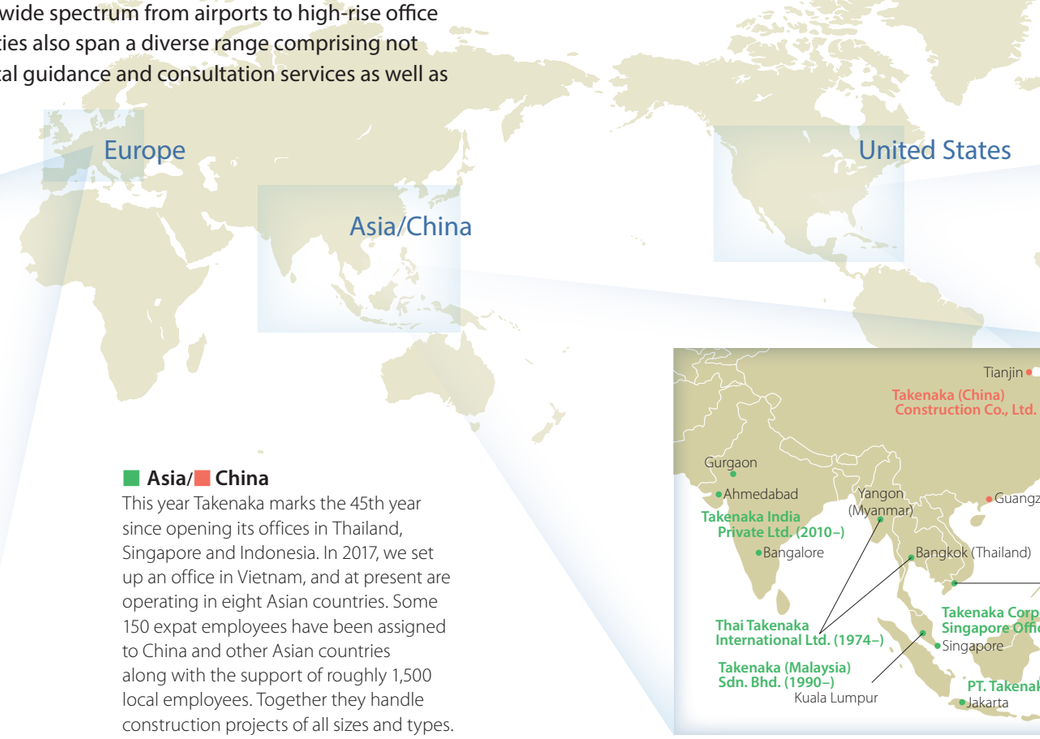
–Contributing to Economic and Social Development in Each Country and Region–

Our international operations began in earnest with our entry into the U.S. market in 1960, and our network now spreads around the world. We have participated in a diverse range of projects in support of our customers, which include Japanese businesses launching overseas operations and public institutions in various countries as well as local business enterprises developing projects across a wide spectrum from airports to high-rise office buildings, hotels, manufacturing plants and museums. Our activities also span a diverse range comprising not only architectural design and construction works but also technical guidance and consultation services as well as materials procurement.

Changi Airport Terminal 4: Creating an airport teeming with greenery

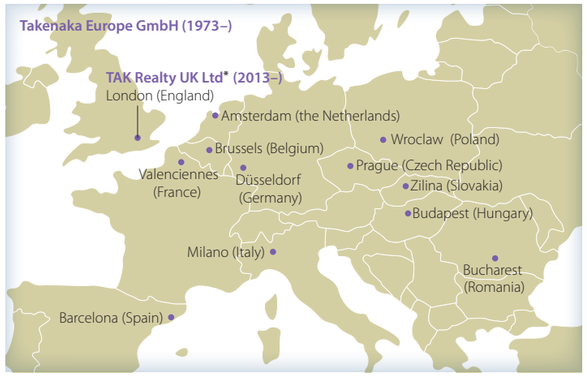
Singapore's Changi International Airport Terminal 4 building opened on October 31, 2017, and a ceremony was held to mark the occasion on August 3, 2018. Through our participation in the development of Terminal 1, which opened in 1981, we have maintained ties with the airport for more than 30 years, providing it with maintenance and updates alongside Singapore's economic development.

The construction period for Terminal 4, a large-scale structure occupying a land area of 400,000 square meters and a total floor space of 280,000 square meters (including adjoining facilities), was only three years. In completing a state-of-art terminal, we used BIM and other cutting-edge methods, which were backed by our expertise and know-how accumulated over the years, and we demonstrated our strengths in design and technology as well as outstanding productivity.



■ Europe

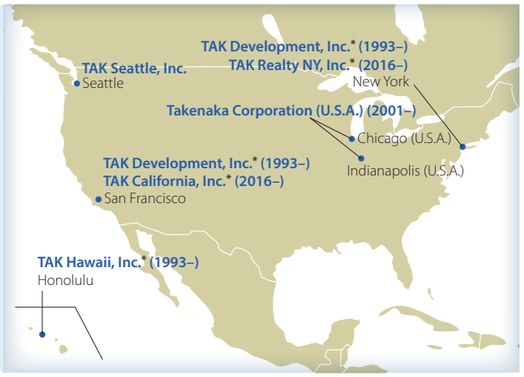
Forty-five years have passed since the company opened a business office in Düsseldorf, Germany in 1973. During that time, Takenaka Europe has undertaken over 1,500 construction projects. Today about 50 employees dispatched from Japan and some 400 local employees working at operating bases in 12 countries collaborate closely to support customers who are considering establishing operations in Europe.



* Development business

■ Asia/■ China

This year Takenaka marks the 45th year since opening its offices in Thailand, Singapore and Indonesia. In 2017, we set up an office in Vietnam, and at present are operating in eight Asian countries. Some 150 expat employees have been assigned to China and other Asian countries along with the support of roughly 1,500 local employees. Together they handle construction projects of all sizes and types.



* Development business

■ United States

Takenaka began laying the foundation for its overseas operations in 1960 after extending its business to the United States where it mainly provided development and consultation services.

Locations of main overseas business offices

Jaguar Land Rover Slovakia New Plant (Slovakia, 2018)

AEON MALL Jakarta Garden City (Indonesia, 2017)

National Gallery Singapore (Singapore, 2015)

CapitaGreen (Singapore, 2014)

Pacific Century Place Jakarta (Indonesia, 2017)

Nexen Tire Europe Technical Center (Germany, 2018)

Nisshin Foods Hungary Factory (Hungary, 2017)

Mitsubishi Motors Indonesia New Factory (Indonesia, 2016)

Wuxi Yakult Co., Ltd. (China, 2015)

Mitsubishi Elevator India New Factory (India, 2016)

FCC Gujarat New Factory (India, 2018)

Toyota Buzz Bangkok New Head Office (Thailand, 2018)

Hamad International Airport Emiri (Royal) Terminal (Qatar, 2013)

Creating New Value Through Urban Creation

We have participated in planning, design and construction of numerous urban redevelopment projects, including projects in metropolitan districts such as Marunouchi and Nihonbashi in Tokyo, the Nagoya Station area, and Umeda, Nakanoshima and Abeno in Osaka. We are also engaging in urban redevelopment, and PPP and PFI projects while proactively pursing proprietary development projects and participating in urban creation organizations. Contributions made through our various urban creation activities also include enhancement of competitive capabilities in international arenas, improvement of safety and security, symbiosis with the environment, and solutions for a variety of other problems and needs facing cities today.

*The underlined projects are initiatives implemented through special purpose companies (SPCs) or independently by Takenaka.

Urban redevelopment projects

Meguro Station District Urban Redevelopment Project

Based on our proposal for a complex comprising offices and commercial buildings, residential buildings and a "wooded area" for recreation and relaxation, we were selected to participate in this joint venture urban redevelopment project encompassing some 180,000 square meters around Tokyo's Meguro Station in 2008. Administrative staff assigned to the project achieved consensus among the 130 landowners and conducted administrative negotiations leading to our selection in 2012 as a designated (joint venture) agent for the design and construction work. With the conversion plan for the rights approved in 2013 and new building construction started in August 2014, the new Meguro landmark was completed in November 2017.

Basic design: Nihon Sekkei
Construction design: Takenaka Corporation

PPP and PFI projects

Minato Mirai 21 Civic Center 20 Block MICE Facility Project

(Scheduled for completion in 2020)

Under this project implemented by the City of Yokohama, which aims to be a "global MICE strategic city," a group of companies led by Takenaka was awarded a contract in 2015 to design, build and operate a new MICE facility (as a PFI project) and a hotel (as a private for-profit project). The facilities are intended to enhance the functions of the famous Pacifico Yokohama international convention center and expected to improve urban amenities for pedestrians as well as enhancing the landscape of the port city. They are scheduled for completion in the 2020 Olympic year.

* MICE concept (Meeting, Incentive, Conference/Convention, Exhibition)

MICE Design and construction: Takenaka Corporation (joint venture)
Hotel Basic concept: Takenaka Corporation

Overseas development projects

Grand Hyatt Kauai Resort and Spa

Takenaka managed everything from development to construction and has owned the Grand Hyatt Kauai Resort and Spa on Kauai, a Hawaiian island renowned for its prolific natural environment. Since opening in 1991, the Hyatt has ranked among the top ten resorts in Hawaii every year. Situated on a 103-hectare site, the facilities include 602 guest rooms, restaurants serving various international cuisines, a spa and a PGA golf course. Takenaka has established significant credibility among Kauai residents through community-based business activities over many years.

Design: Wimberly Allison Tong and Goo
Construction: Takenaka Corporation (U.S.A.)

Rendering
Rendering
Rendering

Udagawa-cho 14/15 Development Project implemented as an urban renewal project

(To be completed in 2019)

This project is underway as an urban renewal project to restructure the area around Shibuya PARCO. The implementation of the project was approved by the government in 2016, and it is slated for completion in 2019. Takenaka is engaged in design, support for planning proposals for this special urban renaissance district, and promotion of the urban renewal project as an agent for specific operations.

Design and construction: Takenaka Corporation

City of Yokohama New Government Building

(To be completed in 2020)

The new city hall is expected not only to provide Yokohama City with administrative and legislative functions, but also to provide a roofed public square for cultural and fine arts events and programs. As the architect and construction contractor responsible from the basic design stage, Takenaka will work on the creation of an open city hall and a new urban landscape that is in the public interest, and it will contribute to the community through workshops and symposiums.

Design and engineering: Takenaka Corporation, Maki and Associates, NTT Facilities, Inc.
Construction: Takenaka Corporation (joint venture)

Global Gate

This urban development complex, comprising office buildings and commercial facilities as well as a hotel and a conference center, forms the core of the Sasashima Live 24 district, which is a center for international exchange located one kilometer south of Nagoya Station. Since winning the competitive bid for the project in 2008, Takenaka was involved in the planning, design, and construction work with the project completed in 2017. At the same time, we acted as a consultant to administrative bodies on the establishment of a special urban redevelopment district, conducted an environmental assessment, and provided project promotional support for commercial tenant leasing.

Design and construction: Takenaka Corporation (joint venture)

ABENO HARUKAS and Tenshiba

Japan's tallest building, ABENO HARUKAS, and the Tenshiba park renewal project, which include huge grassy spaces, had a great impact on the local area. Takenaka engaged in planning support, design and construction, which contributed to increasing the appeal of the area and attracting more people.

ABENO HARUKAS
Design and supervision: Takenaka Corporation
Exterior design: Takenaka Corporation and Pelli Clarke Pelli Architects
Construction: Takenaka Corporation (joint venture)
Tenshiba
Design and construction: Takenaka Corporation

Umekita Development Project

An urban creation project covering a zone area of 24 hectares and total development land area of 1,000,000 square meters for two construction phases combined is currently underway in the area north of JR Osaka Station. For Grand Front Osaka (Phase 1), Takenaka has been engaged in planning, design and construction, and we were a joint developer.

Grand Front Osaka (Phase 1)

This large-scale urban development project, which was completed in 2013, involved a total floor area of some 570,000 square meters.

Basic design: Nikken Sekkei Ltd., Mitsubishi Jisho Sekkei Inc., NTT Facilities, Inc.
Construction design: Nikken Sekkei Ltd., Mitsubishi Jisho Sekkei Inc., NTT Facilities, Inc., Takenaka Corporation, Obayashi Corporation
Construction: Takenaka Corporation (joint venture)

The Second Development Zone in the Umekita Area

A new urban creation project is being promoted for integrated development, administration and management of an urban park (4.5 hectares), which is located at the center of the project zone and combined with a residential area created by land developers.

Consortium
Mitsubishi Estate, Osaka Gas Urban Development, ORIX Real Estate, Kanden Realty & Development, Sekisui House, Takenaka Corporation, Hankyu Corporation, Mitsubishi Estate Residence and Umekita Development SPC

Ote Center Building

This is our own development project at Otemachi, the most prestigious CBD in the heart of Tokyo. Through major improvement works we are providing significant new value and a comfortable business environment.

Design and construction: Takenaka Corporation

400/430 California

Takenaka acquired this property, located in central San Francisco, USA, in 2016. It is a "value-added" project utilizing our strengths in repositioning and renovation of historical landmark buildings with the goal of attracting prospective tenants.

The scale of the photographs and actual buildings differ.

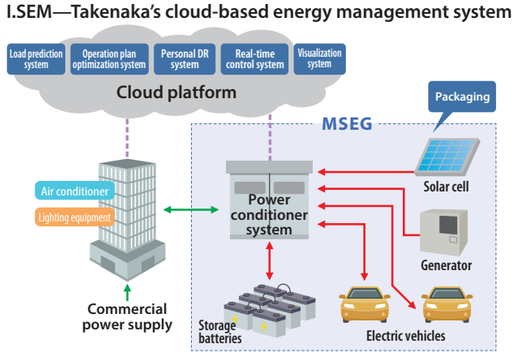
Delivering Ideal Solutions to Help Customers Solve Their Problems

Our customers require speedy responses that correspond to market changes, advanced building environments, and various safety and security. We are responding to these customer needs with total engineering from the project planning stage to building plan development, design, construction and aftercare.

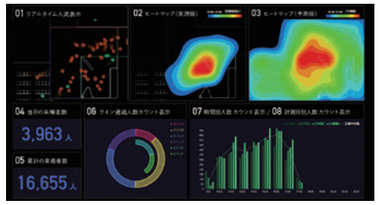
Initiatives in IoT

While economic development has been progressing in recent years, social issues are becoming increasingly complex, such as an aging population with a low birthrate, a decrease in the labor force, global warming, industrial sustainability, and natural disasters. Against this backdrop, there are growing expectations for "Society 5.0," which is a society where issues like these are resolved with the help of advanced IT, such as the "Internet of Things" (IoT) and artificial intelligence (AI) applications. As a first in our industry, we have developed an information platform, the Building Communication System (BCS), which integrates building utility management data gathered from different application systems, and we have now installed this system in several buildings. The core technology of the BCS platform is I.SEM, which visualizes and predicts energy input/output and its usage status in multiple buildings, as well as controlling their utility facilities in real time. I.SEM also offers a Virtual Power Plant (VPP) function that automatically controls power usage in buildings in response to a demand response signal. Through utilization of the BCS platform and I.SEM, we pursue sustainable urban creation represented by the Decarbonized Model Town concept that Takenaka has been promoting since 2016.
We are also conducting research and development on a people flow analysis system that is indispensable to realize the human-centered Society 5.0. In addition to a building usage status assessment technique based on a people flow measurement analysis, we have established our own AI-based people flow prediction technology. Our next aim is to establish technology for people flow prediction and simulation linked with the BIM system.

I.SEM—Takenaka's cloud-based energy management system



People flow analysis dashboard



Optimizing the supply chain

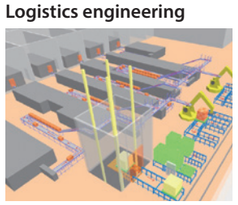
Installation of automation equipment and IoT is progressing in production and distribution facilities in order to address labor shortages and further enhance productivity.
In addition to optimizing the physical distribution of materials, components, and products within a factory, streamlining logistics across the supply chain is necessary. We are aiming to build next-generation highly streamlined production facilities, which are consistent with related construction plans utilizing logistics engineering techniques based on quantitative data.

FY2017 Logistics Award


Kewpie Kobe Factory


Weighed material feed-in process

Logistics engineering


Logistics simulation

Restructuring facilities and functions

Leading-edge pharmaceuticals manufacturing and research facilities

Aseptic, active ingredient/API, implementation of PIC/S GMP, and biohazard prevention—the requirements demanded for pharmaceutical manufacturing and research facilities are expanding day by day. In view of manufacturing regenerative medicine and biomedical products, which are expected to grow further, we continue developing and testing cutting-edge technologies to build advanced, biologically clean and safe environments. Prior to construction, we optimize the structural design for the facilities by discussing the design plan in detail with customers, using BIM-based process engineering.

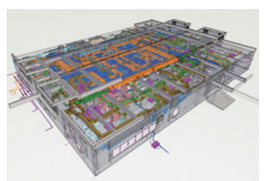
Bioclean and biosafety technology


Takenaka's BCR experiment facility


Visualization experiment

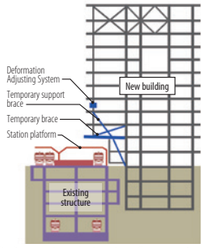
Production process construction cases


Case of syringe manufacturing facility

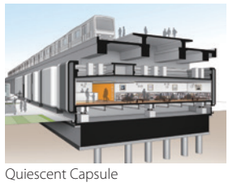

BIM-based process design

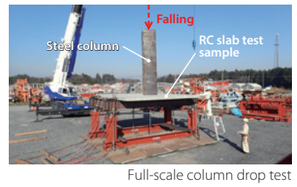
Railway-related architecture

One of the core facilities in urban creation is a railway station. Buildings constructed over or under a railway carry technical issues different from ordinary buildings. We are currently building East Japan Railway Company's Yokohama West Gate Development Building, which has an overhang structure above the railway. To ensure uninterrupted train operations and passenger safety while constructing a sound structure, we have developed "Deformation Adjusting System for Over-Track Cantilevered Building", and "Performance Evaluation Technique of Reinforced Concrete Slabs Subjected to Impact of Falling Objects" with the client. In addition, we are working on various engineering solutions such as "Quiescent Capsule," which achieves a quiet, vibration-free space under the viaduct.



Deformation Adjusting System for Over-Track Cantilevered Building


Quiescent Capsule

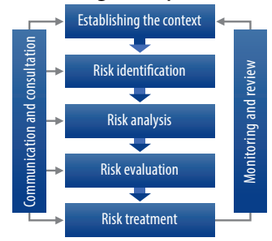


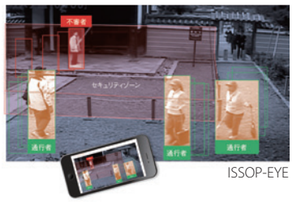
Full-scale column drop test

Supporting BCP, disaster prevention, and security

Many companies are currently revising their risk countermeasures following successive earthquakes and flooding incidents. Takenaka provides comprehensive support for corporate reinforcement of Business Continuity Plan (BCP) and disaster prevention from the early stages of the risk management process. We also offer crime prevention measures for corporate premises through ISSOP-C, the industry's number one risk assessment system, and ISSOP-EYE, our CCTV vision enhancing technology. Uniting our comprehensive capabilities, we support corporate resilience against natural and human disasters.

Risk management process




ISSOP-EYE

Sports facilities and urban creation

Starting with Tokyo Dome, Japan's first all-weather stadium, we have built a variety of sports facilities from dome stadiums to regional arenas.
Lately, people are becoming more interested in sporting events and also their own health promotion. Taking advantage of ample experience and know-how, we will contribute to operators and users of facilities in design and construction as well as through urban creation with thorough understanding of regional characteristics.


Musashino Forest Sport Plaza Main Arena


Tokyo Dome City

Radiation protection technology

Takenaka is the leader in building PET scanning facilities in Japan. Positron Emission Tomography (PET), together with advancing medical knowledge, is effective in identifying early-stage cancers. However, such equipment requires a highly reliable radiation protection structure in the surrounding enclosure. We are also actively participating in building proton and heavy ion therapy facilities to support tackling cancer through the latest radiotherapies. We were the builders of the National Institute of Radiological Sciences' HIMAC New Particle Therapy Research Facilities, where the world's first rotating gantry equipped with superconducting magnets is installed and which offer more patient-friendly treatment. One of our current projects is the East Japan Heavy Ion Center, Faculty of Medicine, Yamagata University, which will accommodate a smaller rotating gantry. Takenaka developed RadBoard and RadBlock, recyclable radiation shielding boards and blocks, and these are being utilized in this project. We plan to further expand their usage in the future.


Heavy particle radiotherapy room (HIMAC New Particle Therapy Research Facilities)


Heavy Ion Cancer Therapy, Yamagata University Hospital (Scheduled for completion in 2019)

Forging the Future with Technology

The Takenaka Research and Development Institute is the group's principal supplier of leading-edge technologies that society requires in the areas of environmental preservation, safety and security as well as production innovations and research and development of innovative proprietary seed technologies. It is contributing to achievement of a sustainable society by providing the world with industry-leading technologies and solutions in every aspect of urban creation.

Takenaka Research and Development Institute

www.takenaka.co.jp/rd

Since its establishment in 1953, the Takenaka Research and Development Institute has continuously provided value, which satisfies customers by creating and assessing new technologies that respond to the needs of the future for the entire Takenaka Group. Specialists in a varied range of fields related to construction gather here to perform research at the world's highest level in collaboration with other research institutions in Japan and overseas. An exhibition hall in which visitors experience cutting-edge technologies firsthand offers customers hints for discovering solutions and creating new businesses, and plays a role in disseminating information that can uncover potential needs. The institute develops technologies for future urban creation in the four domains of technology, which is contributing to the global environment, technology supporting safety, security and comfort, technology creating leading-edge architectural environments and technology enabling advanced construction.

Aerial view of the Takenaka Research and Development Institute

Construction image of new workspace

Aiming to create new value through open innovation

In order to conduct research and development that offers new value to society, the Takenaka Research and Development Institute is undergoing renewal under the following three themes:

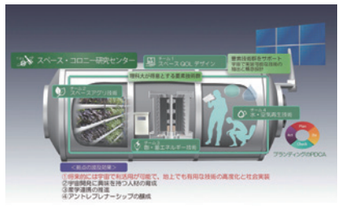
(1) Business process reform: In order to deepen research and encourage better communication among researchers, we plan to introduce an activity-based working style, including free-address workspaces that enable diverse forms of working according to the details of each employee's job. A newly built courtyard will also help create a sense of integration.

(2) Comfortable environment to inspire employees: Greenery will be introduced both in exterior and interior areas of the building to encourage biodiversity. Eco-friendly workspaces will be built based on our KENCHIKU (Healthy Community Development) concept.

(3) Realizing open innovation: The new building will be equipped with an exhibition space and a cocreation area to encourage partnerships with customers, academia, industry and government.

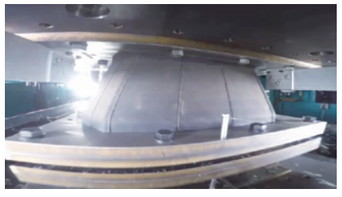
Technologies for living in space

Takanaka is a partner in the research being conducted by the Research Center for Space Colony, Tokyo University of Science. The center is studying four categories for living in space under a collaboration between academia, industry and government with the aim of practical implementation in the future. Category 1: QOL (Quality of Life) and system designs. 2: Agri technology. 3: Energy creation and storage technology. 4: Water and air recycling technology.



QTB, seismic isolation bearing with even higher safety for strong earthquakes

Quake-Thru Bearing (QTB) is a newly developed isolation device which consists of a conventional lead rubber bearing (LRB) and a slider bearing in series. QTB behaves as a conventional LRB which is just friction connected to the building structure at either of the upper or lower end when subjected to design level earthquakes or smaller. In contrast, the sliding behavior prevents the LRB component from hardening behavior and shear break in earthquakes exceeding the design level.



SPADA-stairs with dynamic vibration attenuator

SPADA-stairs are equipped with dynamic vibration attenuation technology, through which the membrane actuators installed at both ends of the stringer boards are activated by vibrations generated from people ascending the stairs, and in response dynamically vibrate the stringer boards to cancel the original vibration. Its compact mechanism enables the product to be installed in a wide range of buildings, including hotels, factories, and commercial facilities. In stairs where design is required, we use a small piezoelectric element to achieve both slim and light design, and difficulty in shaking. We plan to expand application of this mechanism to other building areas such as ceilings.

Business Activities Conducted by Principal Domestic Takenaka Group Companies

Companies in the corporate group headed by Takenaka Corporation respond to the varied needs of customers through every stage of a building's life cycle.

■ Takenaka Civil Engineering and Construction Co., Ltd.

Crafting civil works in consideration of people and the environment

Takenaka Civil Engineering and Construction is the Takenaka Group member company responsible for civil engineering works. Its role is to promote social progress and affluent lives for people by establishing social infrastructure in accordance with the group's management philosophy, "Contribute to society by passing on the best works to future generations." It also engages in corporate activities with a focus on being "people friendly," and aimed at responding accurately to such needs as environmental protection, energy conservation, urban renewal, declining birthrates, aging population, and a highly networked information society based on an environmental policy of "Striving to build social infrastructure that coexists harmoniously with the environment and contributes to sustainable development of society." The corporate message defining the company's mission, "Bridge between people and the earth," guides all its employees as they walk alongside their customers in an effort to create sustainable urban areas with a focus on the establishment of infrastructure that supports various industries and a diverse range of enriched lifestyles.

SHIN-MEISHIN EXPRESSWAY
(courtesy of West Nippon Expressway Co., Ltd.)

■ Asahi Corporation

Providing optimum products and services with consideration and flexibility

Asahi Corporation, which provides optimum products and services to customers under the banner of "consideration and flexibility," contributes to safe and smooth operations in construction sites by supplying high-quality construction materials and related products through its wide procurement networks inside and outside Japan, as well as providing actual construction services utilizing the company's own expertise. Asahi Corporation also has substantial experience in greening work fused with construction technology and offers an integrated service for town landscaping and park creation, covering planning, construction, and maintenance. The company is seeking to expand its future business areas as an expert group with three core business functions of trading, construction, and procurement. By doing so, it is aiming to be a highly valued company that drives the growth of the Takenaka Group as a partner who jointly pioneers and lives the future with consideration and flexibility.

Wall greening: Vertical Forest Light

■ Create Life

Becoming a trusted partner

Create Life was established in 1995 to respond to diversifying employee welfare needs in the Takenaka Group with specialized and advanced services.
At present, Create Life offers a broad range of services to support group employees in maintaining work-life balance, including balancing between work and childcare or nursing care. At the same time, it serves group companies in the areas of payroll, social insurance, general affairs, etc. The name of the company expresses the hope of "providing support to all employees for more prosperous lives." It aims to become a close and trusted partner for group companies and their employees.

Nursing care seminar and counseling session

■ Asahi Facilities Inc.

Preserving the value and safety of customer buildings

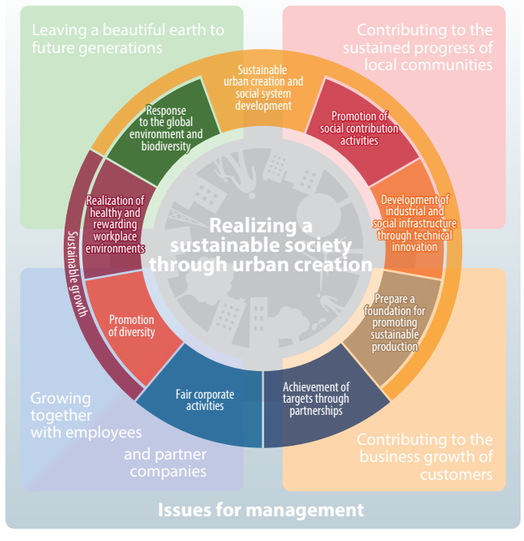
Since its establishment in 1969, Asahi Facilities has been engaged in maintenance operations throughout building life cycles, and it marks its 50th anniversary in 2019. The longer a building's operating lifetime is extended, the higher its value as an asset will be. Asahi Facilities seeks to establish itself as its customers' best partner by helping them derive greater value from their buildings, and offering superior, more attentive services designed to protect and improve their property values. These include operation and maintenance services, security services and building management services that optimize care for buildings in conducting cleaning and other tasks as well as insurance agency services that cover risk management. The company will continue to provide new value that utilizes advanced technology, and it intends to live up to the trust customers have placed in it as a company brimming with hospitality that promptly provides them with one-stop best solutions.

Daily facilities checks

Setting an Agenda for Realizing a Sustainable Society

Our "dream" is to create a sustainable society through architecture and urban creation, and we are working to meet the aspirations of our stakeholders, including the global environment and local communities, the market (clients and end users), employees and partner companies.
To realize our dream, we have identified objectives for creating the shared values (CSVs) that we want to address with our corporate activities (both business and nonbusiness), founded on our group's "CRS Business Vision" and our "Growth Strategy for 2025." We also have established KPIs and targets based on implementing our "CSR Action Plan." In 2018, we worked on the measures this plan encompasses to achieve KPIs and targets, and reviewed some of our implementation to reflect our "uniquely Takenaka" view. Here we report on the results for 2018 and our targets for 2019. Details on the major activities in each of the measures are reported on page 35 and subsequent pages.
In our efforts to become an "integrated engineering firm for urban creation" that contributes to the development of a sustainable society, we will carry out our action plan and develop it further through interaction and discussions with stakeholders and outside experts.

CSV objectives to turn stakeholder dreams into reality for a sustainable future



*1 The targets and results for 2018 as well as the target for 2019 are nonconsolidated targets for Takenaka Corporation, except for the number of community contribution programs (which includes those by overseas subsidiaries).
*2 Icons indicate the targets closely associated with the SDGs goals internationally adopted at the UN Summit in 2015.
*3 The total number of certified individuals as of the end of 2018. Retired workers are not included.
*4 Comprehensive Assessment System for Building Environment Efficiency. The five ranks based on the assessment indicators are: S (Superior), A (Very good), B+ (Good), B- (Slightly poor) and C (Poor).
*5 I. Smart Energy Management. A new energy management system capable of optimally controlling power demand. Standing for Interconnection, Interoperability, Interface, and Interaction, "I" represents the concept of a cloud system that links a variety of hardware and software tools. (See page 29 for details.)
*6 Takenaka's own index exponentially calculated from the total actual labor hours against the total standard labor hours between 2016 and 2018. The total standard labor hours between 2016 and 2018 were determined by a regression equation (2015 standard) based on the labor hours and the value of finished work per building type undertaken between 2014 and 2016.
*7 Accident frequency rate (Accidents followed by absence of four days or more from work): The number of death and injuries in occupational accidents that resulted in absence of four days or more from work per one million work hours in the aggregate.

CSR Action Plan and Results

CSR/CSV objectives	Measures	Pages		Affected stakeholders	Indicators (KPIs)	2018*1 Targets	2018*1 Results	2018*1 Evaluation	2019*1 Targets	Relevant SDGs goals*2
Sustainable urban creation and social system development / Prepare a foundation for promoting sustainable production	1. Identify social and urban problems through dialog and plan strategy.	P35		● ●	Number of fields in which dialogs and strategies have been developed to resolve issues	Society level result: 2 or more areas Urban area level result: 2 or more areas	Society level result: 5 areas Urban area level result: 7 areas	○	Society level result: 1 or more areas Urban area level result: 3 or more areas	9, 11
	2. Promote innovation to resolve issues and establish a foundation.	P35		● ●	—	Develop KPIs for expertise and strategy.	Develop strategies in 11 areas and implement activities.	—	Implement activities.	
	3. Strengthen quality integration and education system.	P36		●	Implementation rate of human resources education	100%	100%	○	100%	
	4. Prevention of public disasters and consideration for the local environment.	P37		● ●	Number of serious public disasters	0	0	○	0	12, 14, 15
	5. Recycle and reduce construction by-products.	P37		●	Rate of mixed waste emissions in construction of new buildings (per volume)	17% or lower	12.4%	○	15% or lower	
	6. Promote green procurement.	P38		●	Rate of projects that utilize priority green procurement items	86% or more	Design 86.9% Construction 85.4%	△	87% or more	
	7. Create a foundation for the development of a sound and attractive construction industry.	P38		● ●	—	Implement Takenaka Meister Certification and other measures to support new entrants to the industry.	Takenaka Meister Certification*3: 490	—	Continue to implement Takenaka Meister Certification.	
Response to the global environment and biodiversity	8. Promote environmentally conscious designs and energy conservation.	P39		● ●	Rate of projects assessed as CASBEE*4 S or A rank Number of ZEB projects Number of I.SEM*5 projects	65% or more 4 or more 3 or more	85.7% 6 projects 3 or more	○	70% or more 5 or more 4 or more	7, 13, 15
	9. Reduce CO_2 emissions from the entire supply chain.	WEB		● ●	—	Disclose information and establish targets.	Establish targets.	—	Disclose information and establish targets accompanied by specific measures.	
	10. Promote measures for biodiversity. *Newly established	P40		● ●	—	—	Implemented the "Seiwadai Forestation Project."	—	Promote the "Takenaka Biodiversity Promotion Program."	
Promotion of social contribution activities	11. Pass down and disseminate architectural culture and technology, and contribute to local communities.	P41		● ● ●	Number of community contribution programs	200 or more	317	○	200 or more	4, 11
Development of industrial and social infrastructure through technical innovation	12. Develop and disseminate technologies to reinforce architecture and urban areas.	P42		● ●	—	Develop advanced technology.	Develop technology related to urban and architectural development.	—	Develop advanced technology and apply for pilot projects.	
	13. Popularize wooden structures and buildings and promote the utilization of domestic timber.	P15 WEB		● ●	Number of wooden structures and building projects	Expand the number of projects.	7 projects	○	9 or more	9, 11, 15
	14. Improve labor productivity through innovation across the entire process.	P42		● ● ●	Labor Productivity Index*6	4.0% improvement (over 2015 level)	6.25% improvement	○	6.0% improvement (over 2015 level)	
Sustainable growth / Realization of healthy and rewarding workplace environments	15. Improve work-life balance through drastic productivity improvement.	P19 WEB		● ●	—	Implement plans.	Implement plans.	—	Follow the implemented plans.	
	16. Provide training to enhance employee growth and management skills.	P43		●	—	Improve the quality of management training.	Organize issues and examine measures.	—	Implement measures on management training.	3, 8, 9
	17. Ensure safe, hygienic site work environments.	P43		● ●	Accident frequency rate (accidents followed by absence of four days or more from work)*7	0.45 or less	0.36	○	0.40 or less	
	18. Promote health and productivity management to improve physical and mental health.	P43		● ●	—	Implement measures and examine targets.	Implement measures and examine targets.	—	Total evaluation score of survey on health and productivity management: 50 or more	
Promotion of diversity	19. Expand opportunities for active involvement of women and seniors.	P44		● ● ●	Rate of women in managerial positions Status of activities of Komachi construction work team Conclusion rate for reemployment contracts	3.6% or more Continuing 80% or more	3.8% 30 teams 90.8%	○	4.1% or more Continuing 80% or more	5, 10
Fair corporate activities	20. Maintain and reinforce internal controls.	P45		●	—	—	Review and disseminate corporate code of conduct.	—	—	
	21. Promote CSR and compliance.	P45		●	Number of serious noncompliance cases	0	0	○	0	10, 16
	22. Promote activities for respect of human rights. *Newly established	P46		● ● ● ●	—	—	Establish a human rights policy and implement human rights due diligence.	—	Implement measures based on human rights due diligence.	
	23. Reinforce information security.	WEB		●	Number of data breach incidents	0	0	○	0	
	24. Develop and reinforce disaster response systems.	P46		● ●	—	Revise business continuity plans (BCPs) on a continual basis, and implement and follow up with exercises and drills.	Implement joint disaster drills and review coordination systems.	—	Revise business continuity plans (BCPs) on a continual basis, and implement and follow up with exercises and drills.	
Achievement of targets through partnerships	25. Deepen understanding of social issues through dialog and confirm policy plans and measures.	P47		● ● ● ●	Number of dialogs, and measures and policy plans	Organize stakeholder dialog meetings and develop measures based on outcomes of the dialogs: 2 or more.	Dialog: 2 Proposal: 2	○	Organize stakeholder dialog meetings and develop measures based on outcomes of the dialogs: 2 or more.	17

● Global/local communities ● Markets ● Employees ● Partner companies

* Evaluation in (○/△/×), for quantitative targets

Sustainable Urban Creation and Social System Development

We construct high quality buildings that take communities and the environment into consideration. We also continue dialogs with stakeholders to develop and provide business models and solutions that help resolve issues regarding the global environment, society, urban areas, customers, and industries through our business and nonbusiness activities.

Measure 1

Identify social and urban problems through dialog and plan strategy.

KPI: Number of dialogs and solution strategies

Society level result: 5 areas (Target: 2 or more areas)

Urban area level result: 7 areas (Target: 2 or more areas)

As an "integrated engineering firm for urban creation," we started holding dialogs with urban areas to identify social issues. Last year, we actually went out into cities to experience actual social issues and started to make urban redesign plans toward finding solutions, as well as developing this process into a solution business model.

● **Dialogs with stakeholders in urban areas** (See page 14 for details)

We have been engaging in dialogs in urban areas by setting a specific topic per area of expertise in collaboration with an ETIC. (Entrepreneurial Training for Innovative Communities) We also hold community dialogs under our own initiative in Koto-ku in Tokyo, Shiojiri City in Nagano Prefecture, and Ogawa Town in Saitama Prefecture, to seek solutions for local issues utilizing our skills and past successes.

● **Society level dialogs**

Inviting experts, we have hosted study groups under themes of Living, Work style, Community, Welfare and living support, and Information/ICT.

Based on discussions in these groups, we have set up KPIs as future directions, following the framework of Measure 2 below.

Dialogs in Urban areas and applicable expertise

Unnan City, Shimane Prefecture	×	Health and longevity
Nishi awakura Village, Okayama Prefecture	×	Biodiversity / Energy
Koto ku, Tokyo	×	Area management
Shiojiri City, Nagano Prefecture	×	Tourism and commerce / Tradition and culture
Ogawa Town, Saitama Prefecture	×	Tradition and culture / Wood structures / Biodiversity

Measure 2

Promote innovation to resolve issues and establish a foundation.

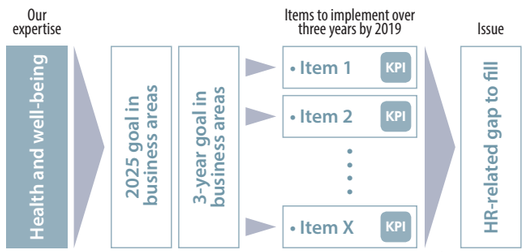
KPI: —

Results: Developed strategies in 11 areas and implemented activities

We set up a road map that leads to innovation and a KPI for each special area for which we create a business model and solution as an "integrated engineering firm for urban creation." Over the last year we have set up these road maps and KPIs in 11 areas, such as Traffic, Tradition and culture, and Living. We are now monitoring the progress of our set KPIs. As a KPI for the area of Health and longevity, for example, we decided to create two solutions that embody our KENCHIKU* (healthy community development) concept by the end of 2018. As a part of achieving this KPI, we have introduced a design to encourage people to think about their physical condition in AEON Mall Miyazaki shopping center. Another related activity was growing edible vegetables in offices to refresh workers' minds, which in turn should stimulate their creativity and sensitivity.

In line with the Measure 1 activities, we aim to conduct a field test to develop an urban area level business model and solution.

* KENCHIKU: Activities that realize spaces in which people can live actively and healthily, from the viewpoint of communication, physical activity, and sensibility.



Framework for setting KPI

Growing edible greens in an office with vege-table

Prepare a foundation for promoting sustainable production

In order to earn society's trust and continue to grow by solving social issues through our construction activities, we are promoting quality assurance and disaster prevention, and contributing to local communities and the global environment. We are also advancing infrastructure improvements through our construction industry.

Measure 3

Strengthen quality integration and education system.

KPI: Implementation rate of human resources education

Result: 100 (Target: 100)

● **Quality integration from the design stage encompassing actual construction**

To make the best use of our Integrated Design-Build System, the Production Department and major partner companies are involved in quality integration from the design stage, and we standardize this business process as a quality assurance system (ISO9001 certified). A construction project office manager is appointed from the basic design stage, and this person is then engaged in determining the structural construction method.*1 Along with the Production Department, which manages the process from the detailed design to the working drawings, our staff members integrate the construction procedure and working drawings by partner companies into the design to ensure quality throughout the project, backed up by construction expertise. We have also started utilizing BIM in all major projects*2 to achieve more accurate designs on desktop computers by matching the facility positions and framework, steel frame distribution, and positioning exterior drainage pathways.

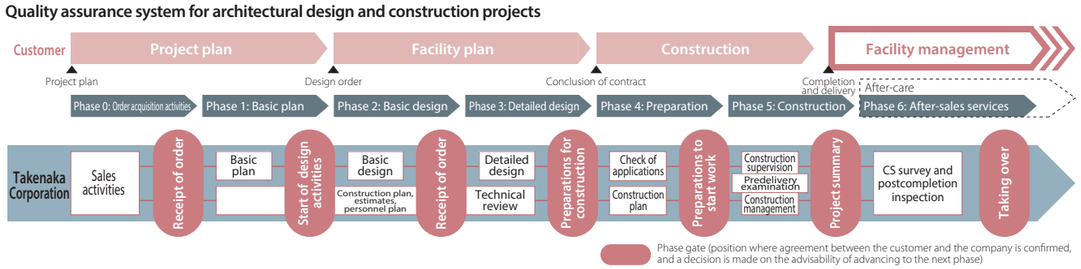
*1 Structural construction method: Structural plan made taking account of production efficiency, such as actual construction and procurement.

*2 All major projects: New construction, expansions, and renovation projects with order values of more than 500 million yen.

Building model with exterior data incorporated

Checking fittings through a model at committee for examining exterior

Quality assurance system for architectural design and construction projects



Life-size model of hybrid structure in Omoi

● **Quality integration education**

To pass on skills for integrating quality into production, we provide training programs for different skills and levels in our practical technology training center (Omoi). In 2018, life-size training models were supplemented with a hybrid structure, which was made of precast concrete components, steel frames and base isolation mechanisms, and a wooden structure using Moen-Wood and CLT.* The training programs now include the latest construction methods that participants can learn through actual experience. A CLT dormitory has also been newly built on the premises to provide the opportunity to stay in a wooden building made from forest resources during the training.

* CLT: Cross-Laminated Timber. Wooden materials in which layers of lumber are glued at right angles to adjacent layers.

Measure 4

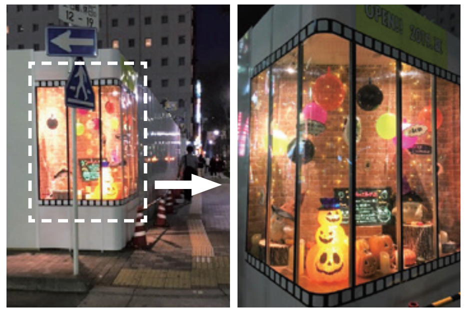
Prevention of public disasters and consideration for local environments.

KPI: Number of serious public disasters

Result: 0 (Target: 0)

Public disasters cause serious damage to third parties, local communities, and customers. As disasters tend to be large, particularly in underground construction work, we put particular emphasis on prior inspection of the construction plan and process management for deep underground construction. In addition, excavation work has a great impact on the local environment, such as traffic to carry out sediment and bring in steel braces to support the earth, dust pollution during excavation, etc. As there has been an increasing number of construction projects over existing underground structures, we are improving safety and reducing construction traffic by streamlining the construction work, including reinforcing existing structures and designing earth bracing utilizing BIM and 3D analysis.
We also give consideration to local residents and environments, such as by making attractive seasonal displays at the corners of construction fences.


Underground work utilizing an existing solid structure


Attractive display on a construction fence

Measure 5

Recycle and reduce construction by-products.

KPI: Rate of mixed waste emissions in construction of new buildings (per volume)

Result: 12.4% (Target: 17% or lower)

The by-product recycling rate in 2018 reached 95.3 percent (ratio by weight) by thorough separation and following 3R activities.* Since 2017, we have specified the KPI for rates of mixed waste emissions in construction, and the figure in new construction has dropped to 12.4 percent in 2018 owing to careful waste sorting. We will continue our efforts with further reduction of construction by-products in the future.

* 3R activities: Waste reduction activities through "reduce, reuse, and recycle."

● **Development of technology to reduce construction by-products**

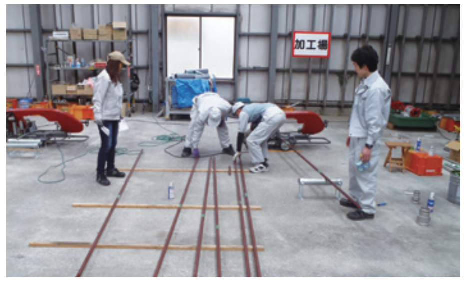
Ground improvement and earth bracing generate construction sludge, and there is now an insufficient number of final disposal sites for this sludge. Sludge is also generated when we use our Grid-Form Ground Improvement Method (TOFT). We have developed a technique to utilize foundation soil mixed with this sludge for ground reinforcement to improve seismic resistance and inhibit liquefaction. Enlarging the grid size also reduces the sludge volume.

As the scope of BIM application has recently been enhanced to include facility areas, we have established a pipe preparation center in Koto-ku, Tokyo. There, we precut pipes to fit the installation destination and deliver them to the construction site, thereby reducing poor cuts.

● **Recycling asbestos as harmless products**

Waste asbestos generated in renovation or demolition projects can be made harmless by melting. However, most asbestos is disposed of in landfills as the quantity of the asbestos collected from each project is small and the number of processing facilities is limited. We have established a system to gather the waste asbestos collected by a transporter company in a storage facility and then dispatch a bulk load of this asbestos to a treatment facility. After the asbestos is treated, pellets are formed which are then recycled as a course base material, while metals coated with asbestos (e.g., pipes and duct pipes) are recycled into steel frames. In recognition of these efforts, we received the Minister of Land, Infrastructure, Transport and Tourism Prize in the 2018 Awards for Distinguished Services in Promoting the 3Rs.


Recycling construction sludge mixed into foundation soil


Precutting work in the pipe preparation center


表彰状

株式会社竹中工務店
東京本店 安全環境部 殿

貴殿はリデュース・リユース・リサイクル推進協議会主催平成三十年度リデュース・リユース・リサイクル推進功労者等表彰事業「事業所・地方公共団体等」分野においてその実績が特に優れリデュース・リユース・リサイクルの推進に貢献するところが多大であると認められましたのでこれを表彰します

平成三十年十月三十日

国土交通大臣 石井啓一

Awarded the Minister's Prize

Measure 6

Promote green procurement.

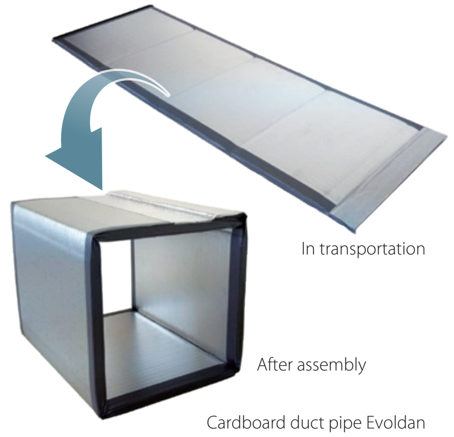
KPI: Rate of projects that adopt 9 or more priority items

Target: Design 86.9% (Target: 86% or more)

Construction 85.4% (Target: 86% or more)

We specify selection policies and guidelines, and items subject to green procurement to obtain materials with low environmental impact in the stages of design and procurement as well as at our construction project office. The list also contains our own environmentally conscious products, such as Evoldan, Vertical Forest, and ECM concrete aiming to disseminate their use in various projects. Evoldan is a collapsible air duct component made with three layers of highly insulated cardboard. The product can be delivered to the construction site as a flat pack and assembled into the duct on the site, significantly reducing CO_2 emissions in the transportation stage.


Vertical Forest wall greening system



Cardboard duct pipe Evoldan

Measure 7

Create a foundation for the development of a sound and attractive construction industry.

KPI: —

Result: Takenaka Meister Certification 490

● **Hands-on construction experience workshops**

In 2018, together with Chikuwakai, an association of our partner companies, the Nagoya Branch Office held hands-on workshops for high school students to experience construction techniques. The workshops were aimed at promoting interest in the construction industry as a future career option, and were attended by 167 students who study construction, and civil and electrical engineering. Under instruction from skilled supervisors having Takenaka Meister Certification, the students experienced 10 different skills, including steel frame assembly, plastering and piping. These were prepared in separate booths that followed the entire construction process. The students gave us comments such as, "Despite many activities being completely new to me, I really enjoyed them"; and, "I would like to contribute to the construction of a grand-scale building in the future."


Construction experience workshop at the Nagoya Branch Office

● **Improvement of Takenaka Meister Certification**

We certify skilled supervisors and engineers to motivate skilled workers and invigorate their construction site. The certification is being improved in stages, such as by introducing new qualifications and increasing the incentive of certified workers. In 2018, we established a new certification, Grand Meister, for 65 year olds and above who already have the Senior Meister certificate, to encourage participation by skilled workers with long-term expertise.

Initiatives at group companies Tokyo Asahi Build Corporation

Passing on craftsmanship to the future

Tokyo Asahi Build Corporation, a reinforcement work specialist, has been delivering hands-on classes, in which its skilled employees provide ferroconcrete reinforcement and formwork demonstrations in technical high schools. The class has been delivered in 13 schools since 2014. We gave demonstrations at technical high schools in Kagoshima, Miyazaki, and Kumamoto Prefectures in 2018. Students commented, "I was impressed by the seriousness and great skill of the professionals—seeing real work being done is very different from a school class." We continue to convey the importance of "building with pride."


Delivering a class at a technical high school

Response to the global environment and biodiversity

Based on our Environmental Policy, in 2010 we presented our Environmental Message, "Connecting People with Nature," and our "Environmental Concept," which aimed for a carbon-neutral society. Since then, we have been constructing energy-saving buildings and cities and protecting biodiversity.

Measure 8

Promote environmentally conscious designs and energy conservation.

KPI: Number of ZEB projects

Result: 6 (Target: 4 or more)

● Promoting zero-energy buildings (ZEBs)

We are actively expanding our zero-energy buildings (ZEBs) by promoting "affordable ZEB" features: (1) Comfortable, (2) Economical, (3) Made with general technologies, and (4) Provide easy and simple energy-saving operations. In the new head office building of TS TECH Co., Ltd., completed in March 2018, we delivered a 78 percent reduction in energy consumption (compared with a standard building) through combining existing general technologies. The building has been certified to be Nearly ZEB by BELS*1 and achieved an "S" ranking by CASBEE Saitama Prefecture. In addition, our Higashi Kanto Branch Office in Chiba Prefecture, which was renovated in 2016 and achieved Net ZEB after a subsequent one-year actual operation record, has been selected as the 2019 First Place Winner of ASHRAE Technology Awards in the category of existing commercial buildings, which will be presented by the American Society of Heating, Refrigerating, and Air-Conditioning Engineers. We are the first Japanese company to receive this award.

*1 BELS: Building-Housing Energy-efficiency Labeling System. The energy efficiency of buildings is certified in the following three ranks. ZEB Ready: 50 percent or more energy savings compared to a standard building; Nearly ZEB: ZEB Ready plus 25 percent or more energy savings from energy creation; Net ZEB: 100 percent energy reduction compared to a standard building.

TS TECH new head office building in Saitama.

ASHRAE award ceremony

Providing electricity to a building for more than 72 hours from 2 PHVs

● Multifaceted and efficient energy management

Combining hydrogen energy and renewable energy with our own energy management system, I.SEM, we are working toward realizing a Decarbonized Model Town. We have been carrying out technical demonstrations in the Shinsuna area of Koto-ku, Tokyo, and in 2018, we conducted a test of continuous electricity supply to a building from plugin hybrid vehicles (PHVs) in the event of an emergency.

Measure 10

Promote measures for biodiversity.

KPI: —

Result: Implemented the "Seiwadai Forestation Project."

The Takenaka Biodiversity Program was set up as a specific means of implementing our Biodiversity Action Guidelines, which were established in 2012. As a part of this program, we host the "Seiwadai Forestation Project" on the premises of the Takenaka Training Center, making the best use of its location to the proximity of Kurokawa, Kawanishi City in Hyogo Prefecture. Kurokawa is known as the best *satoyama* (village forest area) in Japan. The "Seiwadai Forestation Project" has four activities, which are described below. In 2018, we opened the Field Center where most forestation activities take place. Soliciting participants from among our employees across Japan, we conducted a hands-on forestation training program with support from the Museum of Nature and Human Activities, Hyogo. The forestation workshops are designed to provide knowledge that can be utilized in construction work, along with practical forestation skills, such as vegetation surveys and logging. Through these activities, we aim to discover and improve employees' skills and abilities, which can then be applied to social and community contributions. Another aim of the program is to cultivate next-generation leaders who can address a wide range of social issues. By increasing the number of training participants, we aim to realize forest maintenance and conservation led by our employees and thereby promote engagement with local stakeholders. Eventually, we hope that the Seiwadai Forest will become a model site for the practice of ecosystems and biodiversity conservation.

All participants in front of the Field Center

Four activities of Seiwadai Forestation Project

- **Activity 1:** Forest maintenance and conservation led by employees
- **Activity 2:** Hands-on forestation workshop
- **Activity 3:** Workshop program development and dissemination of environmental technologies
- **Activity 4:** Collaboration with stakeholders

Forestation workshop

Initiatives at group companies — Takenaka Civil Engineering & Construction Co., Ltd.

Civil engineering with consideration for the surrounding natural environment and ecosystems

Civil engineering in the natural environment requires extra consideration to preserve ecosystems. In our project to build the foundations for a wind power plant at a nature park in Kochi Prefecture, we applied a range of natural preservation measures. One example was a waterway with slopes so that small creatures, such as frogs, could climb out. We also used seeds of domestic plants for the greening of the slopes. These plants have grown well on the slopes, providing sufficient protection against erosion, while the deep green merges into the background and is pleasing to the eye.

Takenaka Civil Engineering & Construction Co., Ltd. will continue to protect the natural environment through civil engineering in a number of construction project offices across Japan.

Waterway with slopes to protect small creatures

Slope greenery with mixed domestic plants

Promotion of social contribution activities

Under the slogan "with the local community," we undertake social contribution activities in collaboration with various local stakeholders. We nurture people who can solve social issues with a sense of public good and have the aim of local development and cultivation of next-generation human resources.

Measure 11

Pass on and disseminate architectural culture and technology, and contribute to local communities.

KPI: Number of local community contribution programs

Result: 317 (Target: 200 or more)

Disseminating knowledge and technology, communication with local communities, and social contribution activities

● Support for local educational activities

At the Kobe Branch, employee volunteers gathered to teach guest school classes, and in cooperation with "Naniwa Delivery School" and "Oedo Delivery School," we conducted hands-on learning such as experimental building structures for local junior high school students and production of offices where they wanted to work. At Ariake Nishi Gakuen School, a new wooden structure school opened last year in Koto-ku, Tokyo, the project manager responsible for building the school presented a workshop entitled, "How Ariake Nishi Gakuen School Was Built" for the students. In addition to these, we provide numerous workshops on construction knowledge and technologies to schools and communities across Japan.

Kobe Higashi Area FM Center

Ariake Nishi Gakuen School in Tokyo

● Contribution to communication with local residents

Jointly with neighboring companies, we hosted "Wood Education Square" at the Environmental Fair held in Koto-ku, Tokyo, where our Tokyo Main Office is located, and offered a hands-on children's workshop for how to use a plane. We also hosted a birdhouse-making workshop at the Toyo Park Green Festival, along with a presentation on local bird life. In Ishinomaki City, Miyagi Prefecture, we participated in the seventh earthquake recovery event and guided children in making a house with biscuits and sweets as their "Future Ishinomaki."

Toyo Park Green Festival

Children's Town—Ishinomaki

Passing down and disseminating construction culture

● Support for charitable foundations

We provide support to activities of the following three local community interaction foundations in order to connect the past, present and future by promoting culture, art and education: Takenaka Carpentry Tools Museum (passing on traditional technologies and skills to present and future generations); Gallery A Quad (conveying information about contemporary architectural culture to society); and the Takenaka Scholarship Foundation (developing tomorrow's leaders.).

Takenaka Carpentry Tools Museum (permanent exhibition)

● Opening Chochikukyo (an important cultural property) to the public

Now 90 years old, Chochikukyo in Oyamazaki Town, Kyoto, is a wooden house that represents Japanese modernism of the 1920s. It was built by Koji Fujii, who once worked with us, as his own residence. With the help of local residents, we have opened this house to the public to promote architectural culture.

Autumn leaf viewing in Chochikukyo

Development of industrial and social infrastructure through technical innovation

We will challenge state-of-the-art technology development to innovate construction production by fusing the latest technology with environments, safety and security, and the spirit of craftsmanship, which are being called for by our society.

Measure 13: Popularize wooden structures and buildings and promote the utilization of domestic timber.

* See page 15 for further details.

Measure 12

Technological development and evolution centered on fortifying towns and buildings.

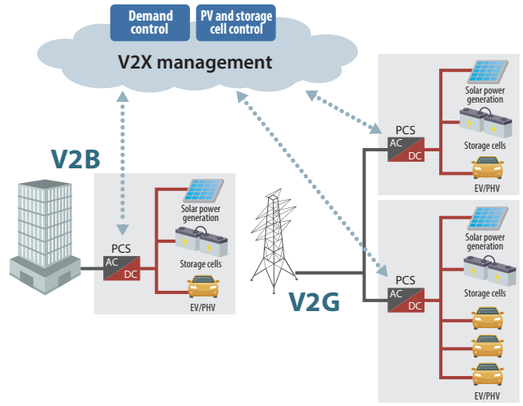
KPI: —

Result: Develop technology related to urban and architectural creation.

We have been working toward "building support technology for a District Continuity Plan (DCP) in a smart community" to ensure continuation of community activities in an emergency situation.

(1) Infrastructural technology for safety and security: Implementation of measures against liquefaction, base isolation artificial ground reaching the size of a city block, and superlong-life concrete that supports such foundations, long-term ground motion countermeasures for superhigh-rise base isolated buildings, etc.
(2) Self-sustaining lifeline technology: Formulating alternative lifeline building methods through efficient investment, etc.
(3) Disaster simulation and monitoring technology: Development of an evacuation behavior prediction model based on group psychology, evacuation simulations utilizing CCTV images (of people and the environment), guide monitoring system during an emergency, etc.

* District Continuity Plan: Strategy to maintain community services during and after a disaster.



Self-sustaining lifeline example

Measure 14

Improve labor productivity through innovation across the entire process.

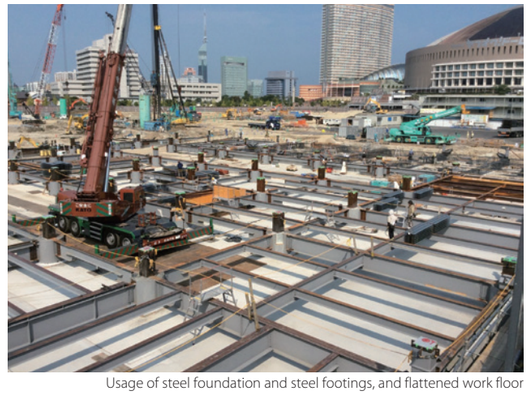
KPI: Labor Productivity Index (over 2015 level)

Result: 6.25% improvement

(Target: 4.0% improvement)

The construction industry must intensify implementation of automation and mechanization to cope with a rapidly decreasing number of skilled workers. We invite the Production Department and partner companies to work together from the earliest design stage of a construction project, aiming to incorporate highly productive building methods and construction expertise. Additionally, the design and working drawings are matched at an early stage to reduce rework. We are also working to expand the application of BIM to digital fabrication and utilization of AI and robots in construction, looking toward the future. With regard to foundation work that requires extremely high numbers of man-hours, we have made significant productivity improvements by incorporating production information into design, such as usage of steel foundations and footings, and unitizing the footings.

Details of steel foundation



Usage of steel foundation and steel footings, and flattened work floor

Sustainable Growth

We are working to create safe and comfortable workplace environments, where employees are motivated and have foresight, and diverse personalities and individuality are respected. To this end, we share an understanding of issues and collaborate on resolving them through close communication with employees and partner companies.

Realization of healthy and rewarding workplace environments

Our vision is to foster a corporate culture in which employees can maintain a good physical and mental state in their work. We aim to build healthy and rewarding workplace environments that develop the skills of each employee, which in turn contribute to productivity enhancements.

Measure 15: Improve work-life balance through drastic productivity improvement.

* See page 19 for further details.

Measure 16

Provide training to enhance employee growth and management skills.

KPI: —
Result: Organize issues and examine measures.

Our new employees spend a year in a company dormitory while experiencing OJT in different departments in order to acquire our traditional spirit, as well as a professional mindset and necessary knowledge. In 2018, we reorganized our job classification education program, which is provided in the second year and onwards, so that the program will raise employees' recognition of their roles when they are promoted and improve their management skills. We continue developing human resources to suit the social environment and our business strategy.

SDGs group work in training for newly promoted mangers

Measure 17

Ensure safe, hygienic site work environments.

KPI: Accident frequency rate (accidents followed by absence of four days or more from work)
Result: 0.36 (Target: 0.45 or less)

We redesigned our uniforms in 2018 to respond to new demands, such as breathability for summer, female-sized ranges, and with large pockets for tablet devices, while at the same time making them more stylish. Depending on the type of workers and work at our construction project offices, it is mandatory to wear a full-body safety harness, which distributes the load across the entire body in case of a fall. We also provide companywide training programs on how to use double-hook safety harness lanyards,* and implement a penalty system for failing to use such safety equipment.

* Double-hook safety harness lanyard: A safety lanyard that incorporates two hooks to attach to a supporting structure.

Stylish and functional new uniforms

Measure 18

Promote health and productivity management to improve physical and mental health.

KPI: —
Result: Implement measures and examine targets.

While our joint research with Chiba University on an office environment for healthy working has been continuing since 2016, we also commenced the Healthy Work Style Demonstration Project with FiNC Technologies Inc, and we have been studying the correlation between new employees' lifestyles in the dormitory and their working styles. Combining the study results with results of the employees' regular health and stress checks, we run a PDCA cycle for working environment improvements. These efforts were recognized by the 2019 Certified Health and Productivity Management Organization Recognition Program.

2019 健康経営優良法人 Health and productivity ホワイト500

The 2019 Certified Health and Productivity Management Organization Recognition Program

Promotion of diversity

With the watchwords of "dialog" and "take responsibility," we aim to create a working environment in which individuals can exert their abilities to the fullest extent according to their personalities in a diverse manner.

Measure 19

Expand opportunities for active involvement of women and senior workers.

KPI: Rate of women in managerial positions
Result: 3.8% (Target: 3.6% or more)

We offer a range of training programs, including those to improve line leaders' skills to support the careers of female workers, and training workshops for women who have been selected to take leading roles in the workplace. A total of 22 female workers were promoted to managerial positions in 2018, aiming to achieve a ratio of 4.5 percent for women in managerial positions by 2020. The number of projects registered under the Komachi construction work team* is now more than 30, resulting in the development of the *Guidebook for Positioning of Women in Work Site Environments* to support women working at construction project offices.
Our endeavors were rewarded in 2017 when we received the Excellence Prize of the Minister of Health, Labor and Welfare under the category of Equal Opportunity Promoting Company, the first time this had been achieved by a construction company
Following the introduction of the Expectation (Role, Position, & Issues) Confirmation Sheet for reemployed workers, which clarifies the performance expected of them, we revised the reemployment system in 2018 to enhance work opportunities for senior workers and offer better working conditions and multiple-year contracts. We also provide a support program to summarize their career, knowledge, and skills prior to reemployment.

* Komachi construction work team: A registration scheme operated by the Japan Federation of Construction Contractors for groups of people actively working to increase female workers at construction sites through improving their working environments. (In Japan, *komachi* is synonymous with feminine beauty based on several historical literary figures who had this name.)

Members of the Komachi construction work team ATG54

Site management using a tablet device

Initiatives at group companies Asahi Facilities Inc.

Engineer training in Minori and social contribution

Asahi Facilities Inc. provides all of their employees with theoretical and practical building maintenance studies using actual facilities at our technical training center, Minori. This aims to nurture building maintenance and management professionals who can understand customer needs accurately and possess a good knowledge of management methods appropriate to different types of buildings. The company also opens its training facilities for internships and hands-on experience for students to spread understanding of the importance of building maintenance and management.

Practical training at Minori

Fair Corporate Activities

Based on our corporate philosophy, we practice "Total Quality Management" in order to obtain customers satisfaction and earn the trust of society. Together with raising our value to society as a corporation, we will fulfill our social responsibilities.

Measure 20

Maintain and reinforce internal controls.

KPI: —
Result: Review and disseminate corporate code of conduct.

Based on the basic policy for internal control, we have developed a corporate organizational framework and implemented awareness building and training, promoted CSR activities and compliance, introduced disaster prevention activities to respond appropriately when risks are high, and promoted crisis management to be conducted under ordinary circumstances. Each of our group companies formulates its own corporate code of conduct that complies with our own to ensure optimal maintenance of the management organization. In response to demands from the international community in recent years, we revised our Corporate Code of Conduct in July 2018. The Code has been distributed among employees and is now well established through e-learning.

Takenaka Corporate Code of Conduct

Article 1	Realization of a sustainable society through customer satisfaction and urban creation
Article 2	Compliance with laws and social norms
Article 3	Disclosure and protection of information
Article 4	Respect for human rights
Article 5	Creation of workplace environments where it is easy to work
Article 6	Contribution to global environment
Article 7	Contribution to society
Article 8	Comprehensive crisis management
Article 9	Respect for international norms and contributions to each country and region
Article 10	Implementation system, and response to violation

Measure 21

Promote CSR and compliance.

KPI: Number of serious noncompliance cases
Result: 0 (Target: 0)

Establishment of framework for CSR and compliance, and implementation of awareness development activities

We established a CSR Promotion Council headed by the president as a central organization for CSR.
We also established a compliance committee headed by the executive officer in charge of compliance under the council as well as CSR and compliance committees at each of our branches. Furthermore, we have established multiple consultation and reporting contacts for Takenaka employees as well as those at other group companies and partner companies. A liaison office for counseling and whistleblowing was also set up to provide a service in this area for suppliers and other business partners.
The CSR and Compliance News is delivered to all employees each month for specific training and awareness development for CSR and compliance. November has been designated as Awareness Month with various programs conducted during the period.

Copies of "CSR and Compliance News"


Seminar on SDGs for executive officers responsible for CSR

Activities to support compliance with the Construction Business Act

We are making ongoing efforts to make sure that our employees are aware of relevant laws and ordinances to ensure that our corporate activities are conducted properly and legally. In association with the Fair Construction Transactions Promotion Month designated by the Japanese government, we have confirmed full legal compliance at all of our partner companies.

Activities to achieve fair procurement and continuous measures against antisocial forces

To fulfill our social responsibility, we have formulated a procurement policy and action guidelines, based on which we are working with our business partners to implement procurement that responds to the needs of society and our customers. We ask our business partners to take specific action based on this policy and guidelines.


Explaining procurement policy and action guidelines at a general meeting of Chikuwakai

Measure 22

Promote activities for respecting human rights.

KPI: —
Result: Established a human rights policy and implemented human rights due diligence

We established our Human Rights Policy on September 1, 2018. Based on the UN Guiding Principles on Business and Human Rights and in compliance with our corporate philosophy and corporate code of conduct, we are taking concrete action on respect for human rights.
In November, a seminar on "Business and Human Rights: Issues for the Construction Industry" was held with Mr. Saul Takahashi, Japan Representative of the Business & Human Rights Resource Centre, as the guest speaker.
He spoke on corporate activities aimed at respect for human rights, and gave a commentary on the UN Guiding Principles and key points of note for the construction industry.
This was followed by a workshop on human rights due diligence by Mr. Hidemi Tomita of Lloyd's Register Japan. Staff members from relevant departments participated and worked to identify human rights risks concerning extended working hours, overseas procurement, foreign workers, etc., and to examine appropriate measures. In the future, we will reflect these measures in our corporate policies, etc., and continue implementing activities such as monitoring and information disclosure.


Lecture on human rights by Mr. Takahashi

Workshop by Mr. Tomita


Group presentations


Commentary on the presentations

Human Rights Policy

Based on the United Nations' "Guiding Principles on Business and Human Rights," respect internationally recognized basic human rights and labor standards, strive for mutual understanding and respect so that people are not treated unfairly from discrimination and harassment due to race, gender, religion, gender identity or disability, and realize healthy and rewarding work environments.

Action Guidelines

(1) We have constructed a human rights due diligence system and are implementing it continuously including solving issues and providing relief to people whose human rights have been violated.
(2) We publicize our initiatives for respecting human rights on our website and by other means.
(3) We request our suppliers and customers to understand this policy and to respect human rights and not to violate them.
(4) We undertake education and enlightenment activities so that this policy is implemented in our business activities.

Measure 24

Develop and reinforce disaster response systems.

KPI: —
Result: Implemented joint earthquake disaster drills and reviewed coordination systems.

We have established a business continuity plan (BCP) for preparedness in the event of large-scale earthquakes anticipated in the near future, and we have set up a disaster management headquarters to confirm the safety of employees and their families and to confirm and repair damage to construction project offices, company facilities and buildings that we have constructed for our customers. In 2018, disaster simulation drills were conducted at eight project offices as training for our initial response. Additionally, training for joint disaster measures was organized to verify the effectiveness of the companywide mutual cooperation system. These drills were participated in by some 12,000 employees, including those from 17 group companies. We will continue to conduct drills for major disasters and improve our BCP to increase our emergency preparedness.


Joint disaster measures training


Earthquake disaster practical training (transport of stockpiled supplies)

Achievement of Targets Through Partnerships

Partnerships with all stakeholders will be activated, issues identified and solutions explored through business activities to contribute to the development of a sustainable society.

Measure 25

Deepen understanding of social issues through dialog and confirm policy plans and measures.

KPI: Number of dialogs, and measures and policy plans

Result: Dialogs 2 / Proposals 2
(Target: Organize stakeholder dialog meetings and develop measures based on outcomes of the dialogs: 2 or more.)


Mr. Takashi Nawa


Mr. Naoki Adachi

In May 2018, two experts were invited to a dialog to assess the level of management and progress made with promoting CSR at Takenaka, get suggestions on what should be strengthened, and define future directions. Mr. Naoki Adachi, president of Response Ability, Inc., spoke on "sustainable buildings and urban creation" and "CSR procurement and management." Mr. Takashi Nawa, Professor at Hitotsubashi University Graduate School, described the latest trends in "growth strategies, and strategy and management." In the course of our discussions on these topics, we identified areas we should explore in the future, including our approach to the lumber supply chain, creating business models and reinforcement of external communications.

Corporate Governance

We are working to develop a corporate governance organization and effective management of the system through activities aimed at improving the quality of our overall corporate activities to satisfy the demands of our customers, earn the trust of society at large, and raise our social value.

Organizational governance
—Improving management quality and confirming governance for rapid, accurate decision making

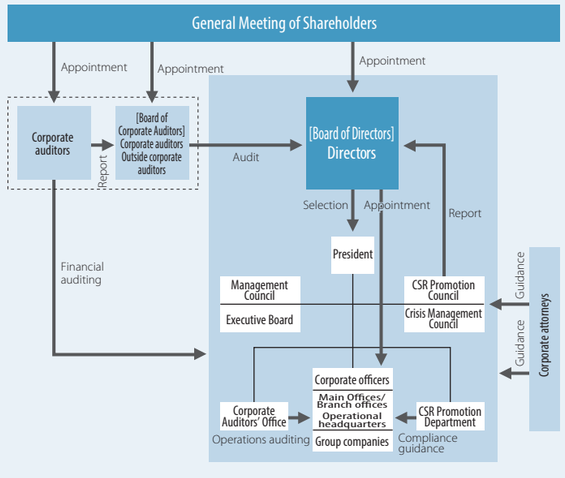
System of Board of Directors and Corporate Officers (basic concept)

The board of directors meets once a month or more often as needed in its capacity as a supervisory body for decisions concerning corporate management and business administration. The corporate officer system was also adopted in 2010 to accelerate the management decision-making process and enhance business administration and supervisory functions.

Board of Corporate Auditors and Corporate Auditors' Office

The Board of Corporate Auditors, which consists of four corporate auditors including two outside corporate auditors, audits the execution of duties by the directors, including attendance at Board of Directors meetings.
In addition, the board is subject to fair, unbiased auditing by an accounting and auditing firm acting as an independent auditor. We have also established a Corporate Auditor's Office as an internal auditing organization to verify the accuracy and justifiability of the state of the company's operational, accounting and financial activities.

Corporate Governance Organization



Moving the warmth of wood and wooden structures, and the human touch into the corporate message

Wide range of activities that show accelerated evolution in action

After reading the latest report, I could see that specific action has started across a wide range of activities in just a year, showing that steady progress is being made toward growth. I was particularly impressed by the assembly-type cardboard duct that cuts down on CO_2 during transport and the "Takenaka Meister Certification" organized in cooperation with partner companies to certify outstanding engineers and team leaders. Furthermore, the concept of "restoring history to the present" found in the Attractive Renewal Project provides the means to build a stock-based society that enables both the preservation and utilization of traditional structures, and is a wonderful message providing the key to local revitalization.

Building a fan base that changes commitment into strength

The impression of a variety of elements being essential in urban creation suggests that Takenaka should move onto a higher level in examining the basic nature of each element and clearly define the company's concept of "what the commitments are and what Takenaka intends to address in earnest." Attractive Renewal Project presents glimpses of Takenaka's commitment to tradition. The two aforementioned activities likewise represent that "this commitment is truly Takenaka" and are expressions to communicate this message.
In the assessment of materiality from the perspective of "importance for the stakeholder" and "importance for the company," the issues that are classified as very high in importance from both aspects are very much the same for every company. It is important to have a firm grasp of what is included in the range regarded as important for the company, even when the level of importance is low at present for stakeholders. I believe that Takenaka's uniqueness, its commitment and the earnestness of its drive will lay a foundation that will eventually draw the support of all stakeholders. The high-rise wooden building built in Sendai with lumber from Oita, for example, was a project that symbolized the "Grand Cycle" linking forests and urban areas. The narrative that organically creates a single ecosystem and lays down the connections shows what is uniquely Takenaka vis-à-vis its close relationship with wooden architecture. In terms of BIM, the description "state-of-the-art" may sound overused by companies in the industry, but Takenaka has put its own unique touch to the latest technologies. If the commitment to tradition, commitment to wood and wooden structures, and the commitment seen in cutting-edge technology show the unique aspects of Takenaka, I believe that the message will serve as a focal point in stimulating empathy and reach a larger range of people, and will drive progress into important areas for both.

Further progress with an approach that is possible only for Takenaka that is embracing people and local communities

For instance, local cities are populated with modern buildings that suggest a Tokyo landscape, diminishing the local characteristics they had possessed to our disappointment. What is expected from Takenaka is urban creation that is not identical, but uniquely its own, designed to enhance its local characteristics and qualities. I believe it is an image of progress as a "comprehensive engineering firm for urban creation," not from the conventional standpoint of a real estate developer, but based on its firm foothold in the traditional concept of urban areas. To do so, it is necessary to build human resources that fulfill the role of "the producer," creating and enhancing the community's distinctive characteristics, to build an environment in which Takenaka-ism is passed on to succeeding generations through a process of community development that requires a very long period of time.

Communicate a message that has "human warmth"

Amid greater sophistication and diversification in building functions, the focal point for Takenaka Corporation is undoubtedly its emphasis on "people friendly," represented by the creation of healthy and comfortable environments, happiness and joy, and nurturing. The future issues for the company lie in how to enrich people's lives and express human warmth—communication of human and emotive aspects in words that are bold and daring. Through repeated efforts in executing this process, I believe that Takenaka will be able to create its own "icon of specialty" not found among the SDGs' 17 targets, leading to the emergence of the essence of its corporate message.

Takashi Nawa
Adjunct Professor, International Corporate Strategy, Hitotsubashi University

Born in 1957 in Kumamoto Prefecture, Professor Nawa has a Bachelor of Arts degree in Law and Political Science from the University of Tokyo and an MBA from Harvard Business School (as a Baker Scholar). He has work experience of roughly 10 years in the industrial plants and infrastructure sectors at Mitsubishi Corporation, and approximately 20 years of consulting experience as a director at McKinsey & Company until 2010. He has been involved in a wide range of projects, including next-generation growth strategy planning and companywide restructuring in numerous industries in Japan, other Asian nations, the United States, etc. He was appointed to his current post in June 2010. His books include *CSV Management Strategy and Principles of Growth Businesses: Theory of 21st Century Business Management Observed in 100 Top Global Businesses, Full Spectrum of Techniques in Problem-solving and Value Creation that Transcend Consulting, Textbooks on Corporate Reform*, etc.

Income Statement and Balance Sheet (Consolidated)

(Millions of yen)

	77th term 2014	78th term 2015	79th term 2016	80th term 2017	81th term 2018
Orders received	1,418,103	1,295,029	1,291,682	1,391,442	1,397,818
Revenues	1,150,663	1,284,362	1,216,570	1,295,951	1,353,627
Operating income	27,741	59,883	91,367	107,988	85,063
Operating margin (%)	2.4	4.7	7.5	8.3	6.3
Ordinary income	38,367	68,666	93,572	115,304	93,977
Net income	23,545	44,140	61,432	75,762	63,638
Net assets	471,436	521,011	566,470	652,033	671,189
Total assets	1,240,256	1,342,971	1,318,055	1,450,191	1,476,490

Other Financial Data (Consolidated)

(Millions of yen)

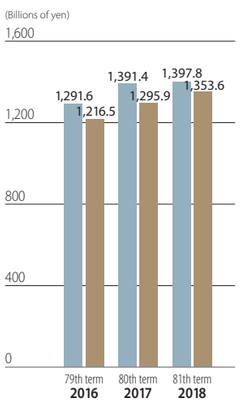
	77th term 2014	78th term 2015	79th term 2016	80th term 2017	81th term 2018
Cash flow from operating activities	14,674	40,032	87,883	88,476	107,719
Cash flow from investing activities	△5,207	△20,119	△48,695	△42,847	△40,772
Cash flow from financing activities	12,984	2,415	△147	△14,235	△32,662
Research and development expenses (Billions of yen)	5.7	6.2	7.0	7.7	8.4
Capital investment (Billions of yen)	27.2	25.3	62.3	56.5	27.0
Return on equity (ROE) (%)	5.2	9.0	11.4	12.6	9.7

Revenues by Business (Consolidated)

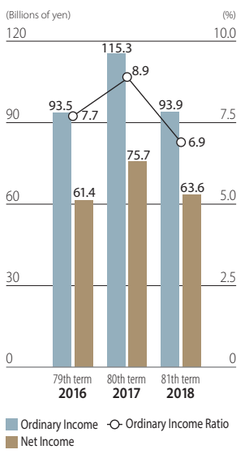
(Millions of yen)

	77th term 2014	78th term 2015	79th term 2016	80th term 2017	81th term 2018
Construction business	1,063,666	1,188,308	1,104,999	1,193,475	1,241,868
Development business	48,287	46,743	59,868	49,653	59,045
Others	38,709	49,309	51,703	52,822	52,713

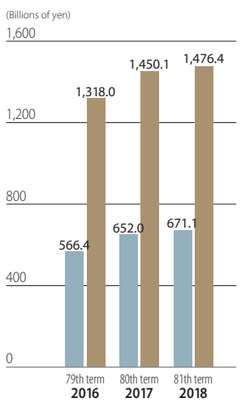
Orders Received/Revenues (Consolidated)



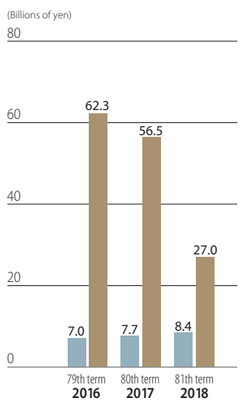
Ordinary Income/Ordinary Income Ratio/Net Income (Consolidated)



Net Assets/Total Assets (Consolidated)



Research and Development Expenses/Capital Investment (Consolidated)



Revenues by Region (Consolidated)

(Millions of yen)

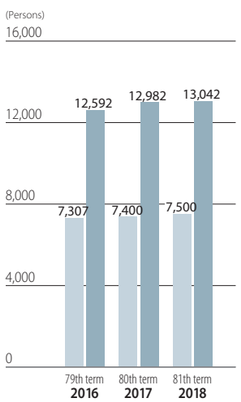
	77th term 2014	78th term 2015	79th term 2016	80th term 2017	81th term 2018
Japan	960,443	1,090,954	1,043,880	1,128,429	1,180,889
Asia	129,903	134,923	117,939	91,847	87,339
Europe	33,308	27,783	26,114	46,353	52,678
North America	25,921	30,701	28,636	29,320	32,719
Others	1,086	—	—	—	—

Nonfinancial Data (Nonconsolidated)

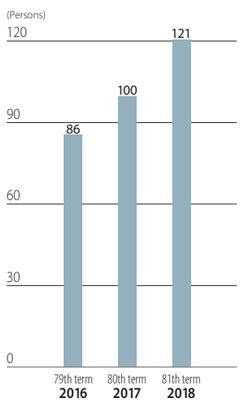
	77th term 2014	78th term 2015	79th term 2016	80th term 2017	81th term 2018
Number of employees (Consolidated)	7,133 (12,187)	7,195 (12,328)	7,307 (12,592)	7,400 (12,982)	7,500 (13,042)
Average age of employees	44.7	44.4	44.3	44.0	44.0
Average length of continuous employment (Years)	20.2	19.8	19.6	19.2	19.1
Number of women in managerial positions	68	78	86	100	121
Accident frequency rate (Accidents followed by absence of four days or more from work)*1	0.55	0.47	0.33	0.41	0.36
CO_2 emissions intensity during construction work (t/100 million yen)*2	10.8	10.6	10.5	10.0	10.4
Rate of final disposal of construction waste (Wt. %)*3	3.2	2.7	2.7	2.3	4.7
Rate of number of CASBEE S- and A-rank projects (%)*4	61.2	52.0	67.1	77.3	85.7

*1 Percentage of the number of occupational injuries caused by industrial accidents accompanied by an absence of four days or more from work for every million man hours of labor
*2 Per value of completed work
*3 Does not include construction sludge and specially controlled industrial waste.
*4 Total number of S- and A-rank projects among the company's design projects. The number for 2014 was revised.

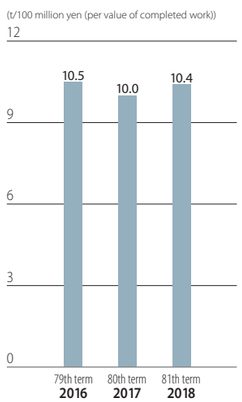
Number of Employees (Nonconsolidated and Consolidated)



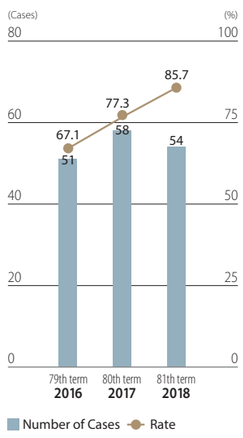
Number of Women in Managerial Positions (Nonconsolidated)



CO_2 Emissions Intensity During Construction Work (Nonconsolidated)



Number of CASBEE S- and A-Rank Projects/Rate (Nonconsolidated)



Dreams into Reality for a Sustainable Future

TAKENAKA

TAKENAKA
120th ANNIVERSARY

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