Project Gallery

Pacific Consultants

Producing The Future™

Pacific Consultants Co., Ltd.

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www.pacific.co.jp/e

2017.9

Drawing a line on a topographic map

The *life* of a massive bridge, disaster-resistant river or a sophisticated structure begins the moment when the first line is drawn in a topographic map.

Imagining a structure that is a source of pride by the people,
we draw lines with our sophisticated technological capabilities.
The lines constitute a surface,
which develops into a three-dimensional object.

Embodying the future of the town

Through dialogues with society and local communities about
a number of topics related to the town – such
as the transportation network, environment,
energy and education – we draw the future.

We are proud that our job of designing structures
and embodying the future of towns leads to
the creation of affluent towns.

Our mission at Pacific Consultants is
to remain sensitive to the needs of society
and provide new value.

Cover photo: **Minami Honmoku Hama Road**

This is an elevated road that links the container terminal of Minami Honmoku Pier with Tokyo-Expressway and Honmoku Pier. It has improved the efficiency of container transportation between piers. It has also enhanced the cargo pick-up environment of Yokohama Port by directly linking it to the expressway network.

Road design standards	Type 4, Class 1, design speed at 60km/h, two lanes
Length of the elevated road	2.5km (Detailed design conducted for a 1.9km section)
Completion	March 2017

Contents

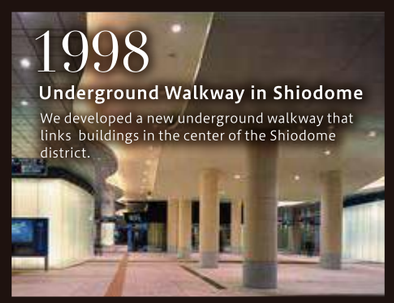
The history of **Pacific Consultants**

1949
Survey of Oku-tadami River
The original founders of the company conducted an on-site survey of the river for electric power development that would support the reconstruction of postwar Japan.

Eric Floor, second president of P.C.Inc. [Front row, fourth from left]
Antonin Raymond, first president of P.C.Inc. [Front row, fifth from left]
Tashiro SHIRAISHI, who was working on the foundation of the company [Front row, third from left]
Soushiro SHIRAISHI, second president of the company [Back row, fourth from right]
Fukujiro HIRAYAMA, first president of the company [Back row, fifth from left]
Yasuo KONO, third and fifth president of the company [Front row, far left]

1967
New Tokyo International Airport
We designed the runway and other airport facilities, with the objective of developing a state-of-the-art international hub for Tokyo.

1971
Tanegashima Space Center project
We designed the Osaki Range at Tanegashima Space Center, which was aimed at launching rockets for commercial satellites.

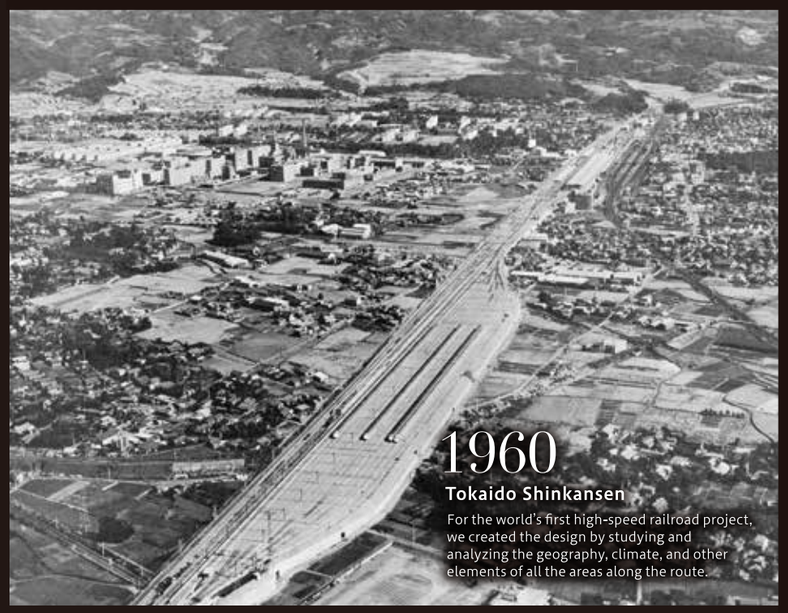


1998
Underground Walkway in Shiodome
We developed a new underground walkway that links buildings in the center of the Shiodome district.

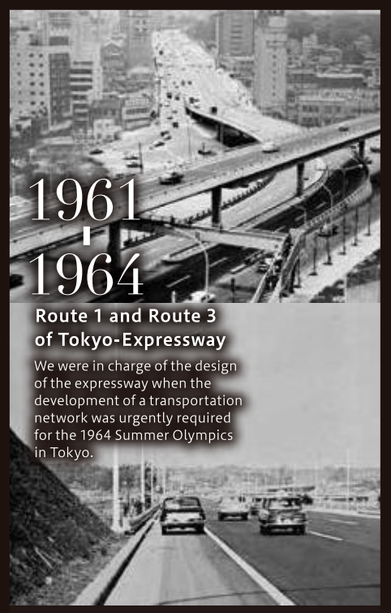
1993
Minato Mirai in Yokohama
In a project for renewing the Minato Mirai district in Yokohama, we conducted the basic design for the development of the central district.

2004
Tokyo International Airport expansion project
We were involved in all phases, from planning of the D-runway to surveys, contracts, design and construction management.

2006
Metropolitan Area Outer Underground Discharge Channel
Water from flood stagerivers is diverted into this underground channel and discharged into the Edogawa River to reduce flooding damage. We tested the discharge capability using a hydraulic model in addition to conducting hydrologic calculations.



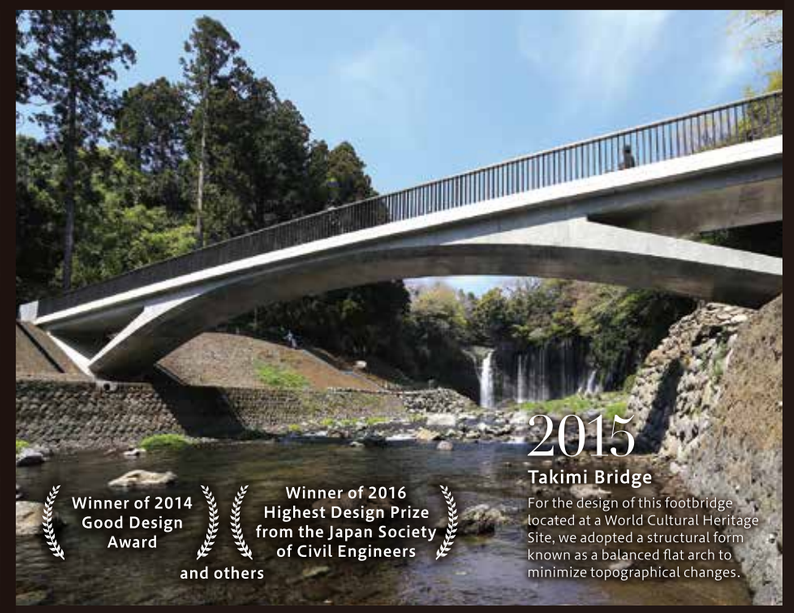
1960
Tokaido Shinkansen
For the world's first high-speed railroad project, we created the design by studying and analyzing the geography, climate, and other elements of all the areas along the route.



1961
1964
Route 1 and Route 3 of Tokyo-Expressway
We were in charge of the design of the expressway when the development of a transportation network was urgently required for the 1964 Summer Olympics in Tokyo.

2009
Shibuya Station Construction Project
We designed the Tokyo Metro Fukutoshin Line in Shibuya Station, a huge space that was created in an underground section congested with many buried objects, the Hanzomon Line and the Ginza Line.

Winner of the 2008 Outstanding Civil Engineering Achievement Award from the Japan Society of Civil Engineers



Winner of 2014 Good Design Award

Winner of 2016 Highest Design Prize from the Japan Society of Civil Engineers

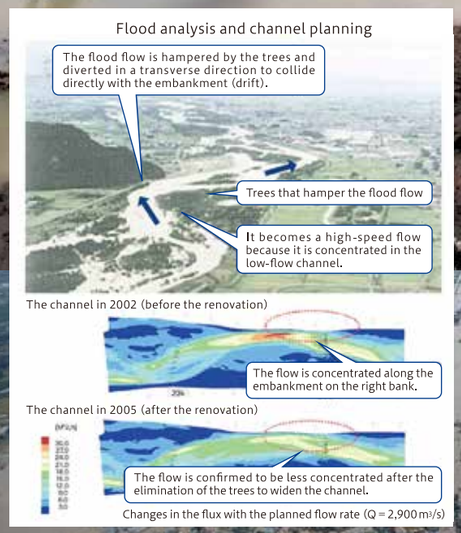
and others

2015
Takimi Bridge
For the design of this footbridge located at a World Cultural Heritage Site, we adopted a structural form known as a balanced flat arch to minimize topographical changes.

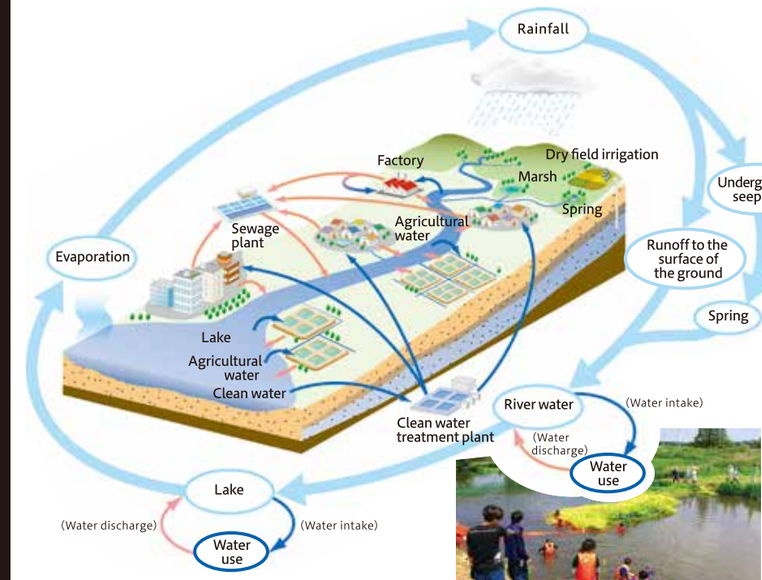
01
Land Conservation

Making our homeland a place where we can live with a sense of security

Water is an essential resource for humans and other living creatures. The history and culture of Japan were formed by taking advantage of resources and protecting life and property from disasters. To protect and develop this beautiful country, we will actively make recommendations from the viewpoints of engineering and policy.



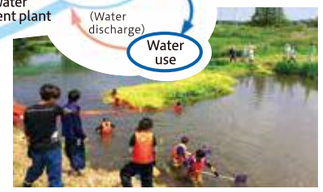
Flooding of a river [Kinugawa River on September 25, 2015]
Photo provided by: Aero Asahi Corporation



River

Creating activities for ensuring a sound basin water cycle, the core of local revitalization

To be achieved by understanding how to ensure a sound water cycle, such as through water purification, and having strong community awareness and cooperation.



Ensuring a sound water cycle through the civil activities of the local residents

Adaptive management of foreign species is carried out in cooperation with a university and the local government and using extermination methods implemented by a citizens' group.

Purification of water such as ponds in parks, as local water environment resources

Purifying the water in the ponds of parks and other enclosed water areas by making use of events such as *kaibori* (draining and cleaning a pond) and other measures.

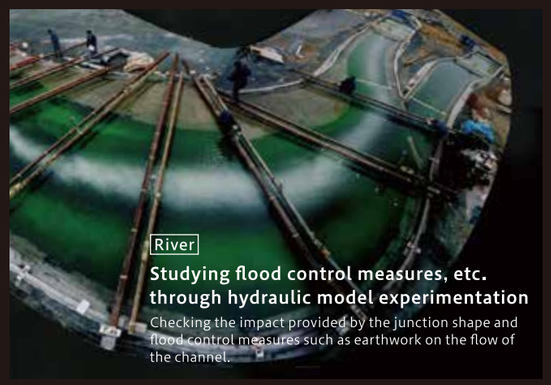
Restoring the river to its natural state through nature classes and other events

Creating opportunities to restore the river to its natural state and interact with nature through nature classes such as the Mizube-no-Gakko (Riverside School for Fun) at Chikuma River and other events.

Sand erosion control(SABO)

Implementation of measures for preventing the recurrence of landslide disasters

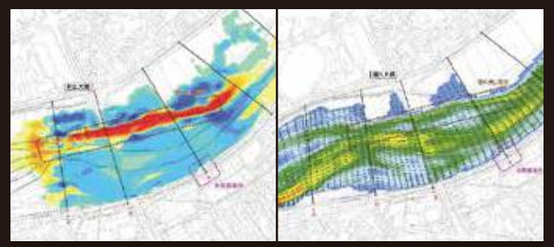
We designed a dam for sand erosion control, which is aimed at protecting not only human life but also houses and assets, at the site of a landslide disaster in Hiroshima City.



River

Studying flood control measures, etc. through hydraulic model experimentation

Checking the impact provided by the junction shape and flood control measures such as earthwork on the flow of the channel.



River

Analyzing the effects of countermeasures on the water colliding front through simulations

Two-dimensional unsteady flow analysis was applied to analyze the effect of partial excavation of the sand bank to create a water way for reducing the flow rate at the colliding front.

Dam

Design and maintenance of dams

For more than 40 years, we have been engaged in surveys, maintenance planning, design of the main body and other works for Naganuma Dam. We have also obtained the naming rights and hold events aimed at letting the public know the roles of the dam and its relationship with the local community.

Port/Coast/Sea

Earthquake-resistant berth design for large cruise ships

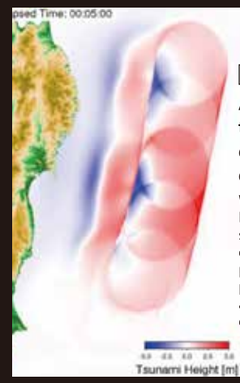
We designed the pier as the tourist entrance to an Okinawan resort where large cruise ships are docked. It is also a berth that becomes a base for the transportation of emergency supplies and travel in the event of a major disaster.

Model experiment of a highly resilient sea embankment

Port

Designing a highly resilient sea embankment for the entrance to Onagawa Harbor

We designed the sea embankment at the harbor entrance for recovery, using a model to experiment with damage in a disaster, as a highly resilient facility.



Port/Tsunami

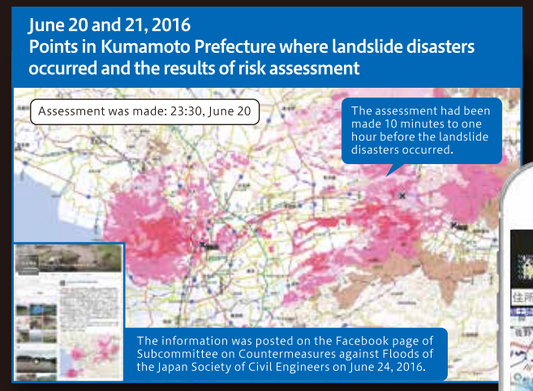
Analysis of the tsunami triggered by an earthquake off the Pacific Coast of Tohoku

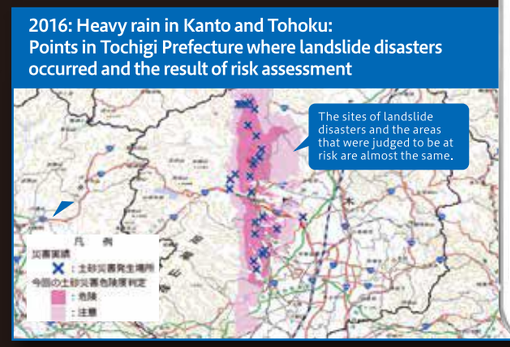
We predict various potential hazards for tsunami and provide support for the formulation of earthquake reconstruction plans and disaster prevention plans, including the planning and design of coastal and river embankments.

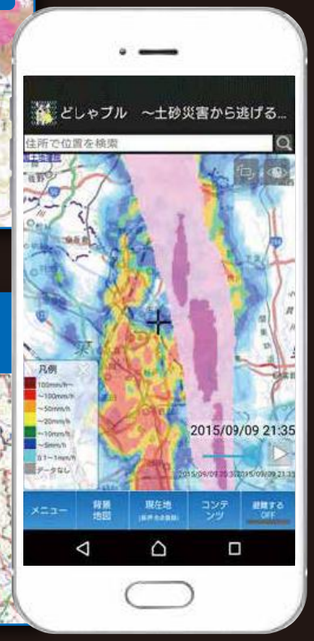
Water supply and sewage

Planning and design of water supply and sewage facilities

Support for the continuous operation of water supply and sewage.
[Opening: April 2016]







Disaster prevention/Erosion control

Dosha-buru, a service for providing landslide risk information for protecting lives

We have developed an integrated method of landslide risk assessment and a smartphone application which supports evacuation activities with an alert function.

Equipment configuration of a simplified water gauge

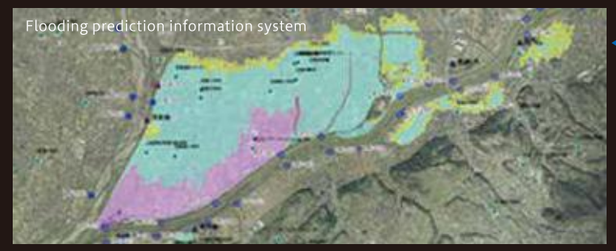
Simplified water gauge with a water level sensor that is easy to install and operate, camera, telecommunication equipment, and power supply

River water level is measured and the data is transmitted on a real-time basis.

Ranking of risk of overflowing

Water levels and images of points at risk are checked.

Areas expected to be flooded are checked.



Disaster prevention/River

A system for identifying points at risk for flooding with flooding prediction analysis and a simplified water gauge

A system which provides information about areas at risk of flooding by integrating a newly-developed simplified water gauge and flooding risk analysis.

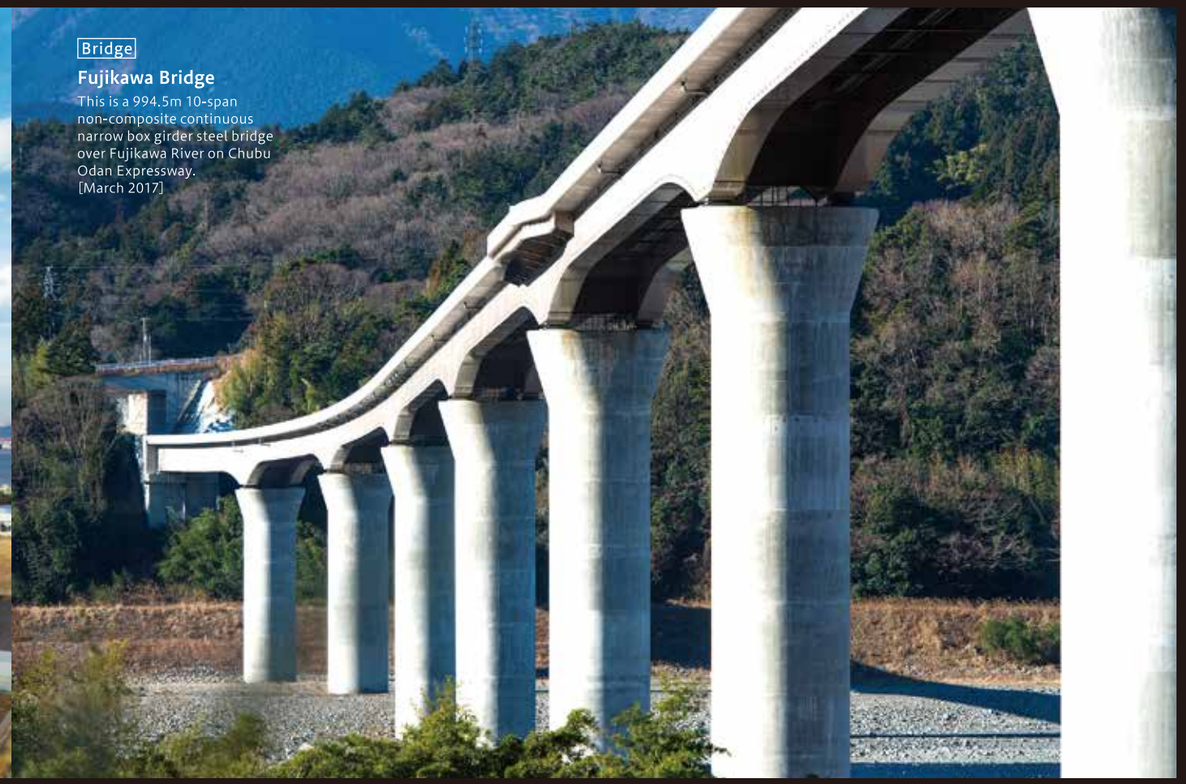
Safety, security, comfort and smoothness
Going where we are needed

To develop a better transport infrastructure for revitalizing national land,
we provide comprehensive services for projects related to transport,
such as roads, railroads and aviation.
Our service areas include project evaluation,
development method, development plan, schedule design, structural design, facility design,
construction management and maintenance and management.

Road

Ukishima Junction

A road plan for linking Bayshore Route, Kawasaki Route and Tokyo Bay Aqualine.



Bridge

Fujikawa Bridge

This is a 994.5m 10-span non-composite continuous narrow box girder steel bridge over Fujikawa River on Chubu Odan Expressway.
[March 2017]

02
Transportation Infrastructure

Road

Measures for preventing traffic accidents

Studying and designing measures such as colored pavement at points of risk and road surface indications.

Road

Bicycle navigation lines at the Sengoku 1-chome crossroads

Navigation lines were drawn in the crossroads to clarify where bicycles should pass, so as to ensure the safety and security of bicycle traffic.

Bridge

Takimi Bridge

This bridge is located downstream from Shiraito Falls, a World Cultural Heritage Site that is surrounded by beautiful areas and natural monuments. We designed this bridge while restricted by many constraints.

2016 Civil Engineering Design Prize

Bridge

Tama Ohashi Bridge

A 7-span continuous box girder steel bridge.
Length: 461m Arch span: 150m

2007 Japan Society of Civil Engineers Tanaka Award

Bridge

Kiyosuna Ohashi Bridge

This is a 3-span continuous cable-stayed bridge, with a length of 547m crossing the Arakawa River. Consideration was given to its proximity to Tokyo Metro Tozai Line, which is adjacent to the bridge.
[Opening: March 2004]

Bridge

Shiodome Elevated Bridge [Reconstruction]

We designed the renovation of this bridge on the Yaesu Route part of the Tokyo-Expressway, which interferes with a tunnel on Circular Route 2. This is a precedent for the large-scale renovation of an aging elevated bridge in an urban area.
Length: 93.547m (inner track)/ 101.056m (outer track)
Rigid frame box girder bridge with steel plate deck with integrated upper and lower sections.

2013 Japan Society of Civil Engineers Tanaka Award

Bridge

Tenryukyo Bridge (CG)

This is a 280m upper-deck type steel arch bridge on Sanen-Nanshin Expressway. It crosses the Tenryu River in Iida City, Nagano Prefecture. Consideration was given to the landscape, because it is located in Tenryukyo Canyon, a place of scenic beauty. [Planned opening: 2019]

*The actual bridge will differ from the above in its coating color.

02
Transportation Infrastructure

Tunnel

Tsukiji-Toranomon Tunnel

We designed this tunnel for cars between Shinbashi and Toranomon on Circular Route 2 of Tokyo City.
[Opening: March 2014]

Tunnel

SENS method

A safe, rational, economical tunneling method which combines the advantages of the shield tunneling method, NATM method and ECL method.

Tunnel entrance construction

Tunnel

Mino Tunnel

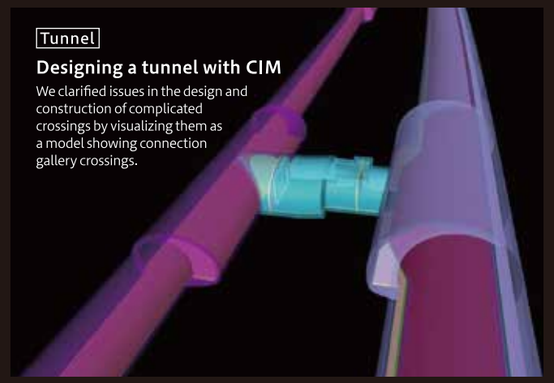
This is a long, 5.6km tunnel on Mino Green Road. It is one of the largest tunnels with a super-large section of 300m².
[Opening: May 2007]

Inside of the tunnel

Tunnel

Haguro Tunnel

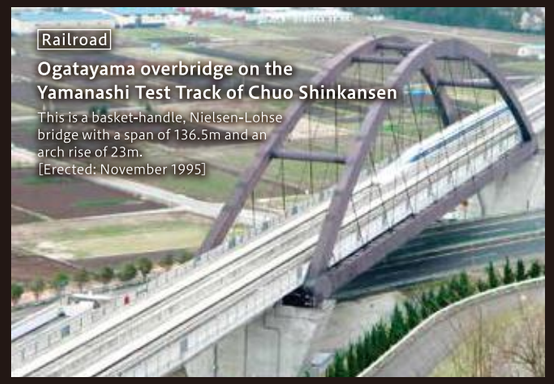
Haguro Tunnel was damaged by the Chuetsu Earthquake. We planned this tunnel as a twin tunnel with separate up and down lines, together with the existing walkway tunnel, which had been built in parallel with Haguro Tunnel.
[Opening: September 2007]



Tunnel

Designing a tunnel with CIM

We clarified issues in the design and construction of complicated crossings by visualizing them as a model showing connection gallery crossings.



Railroad

Ogatayama overbridge on the Yamanashi Test Track of Chuo Shinkansen

This is a basket-handle, Nielsen-Lohse bridge with a span of 136.5m and an arch rise of 23m.
[Erected: November 1995]

Railroad

Bridge over Yomasegawa River

We designed this 3-span continuous PC box girder bridge for Hokuriku Shinkansen. 217m long, it is among the largest of similar structures on the projected lines.
[Opening: March 2015]

Railroad

Narita Rapid Railway

We were involved in the project for constructing this airport access railroad with total length of 51.4km. It was designed for trains that run at 160km/h, among the fastest of conventional lines.

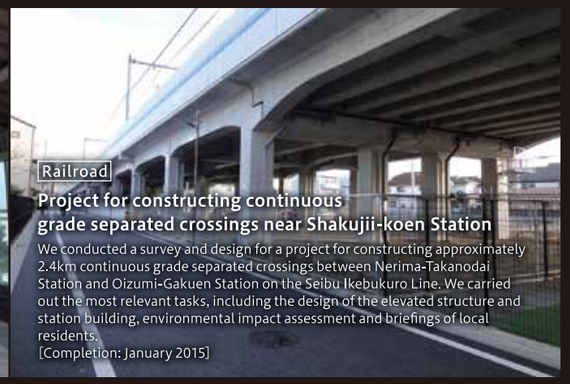
2010 Outstanding Civil Engineering Achievement Award from the Japan Society of Civil Engineers

Railroad

Continuous grade separated crossings near Chofu Station

This is the world's first design that has enabled a small soil cover under the railway track and each shield tunnel is placed in very close proximity to each other.

2011 Outstanding Civil Engineering Achievement Award from the Japan Society of Civil Engineers



Railroad

Project for constructing continuous grade separated crossings near Shakujii-koen Station

We conducted a survey and design for a project for constructing approximately 2.4km continuous grade separated crossings between Nerima-Takanodai Station and Oizumi-Gakuen Station on the Seibu Ikebukuro Line. We carried out the most relevant tasks, including the design of the elevated structure and station building, environmental impact assessment and briefings of local residents.
[Completion: January 2015]

Aviation

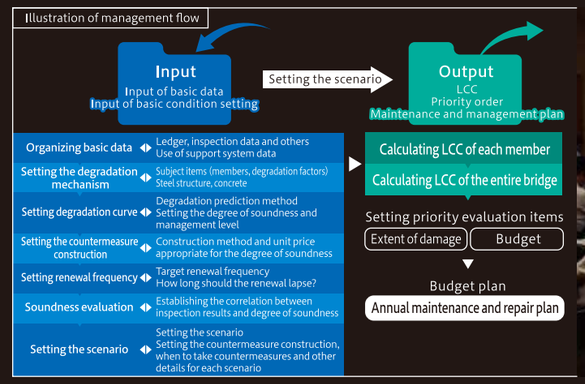
Integrated solution services

We provide comprehensive solution services by integrating cutting-edge technologies in various fields, including bridges, tunnels, railroads and roads.

Aviation

Project for building the D-runway at Tokyo International Airport

This is a project for building the fourth runway, which is 2,500m long, and a taxiway off the coast of the Tokyo International Airport. We were in charge of the in-house consulting for the design-build and overall construction management in the large-scale, rapid construction.



Asset management

We provide integrated solutions for infrastructure management from inspection to the formulation of policies and plans, maintenance and repair design and project methods.

03
Urban Planning

Creation of urban space and mobility that enhance city appeal

We provide a broad range of consulting and management services designed to make people's lives comfortable and very satisfying.
They include policy recommendations for creating vitality in cities and local communities, formulating various plans, creating attractive urban spaces, and implementing complex construction of urban projects.

As of October 2012

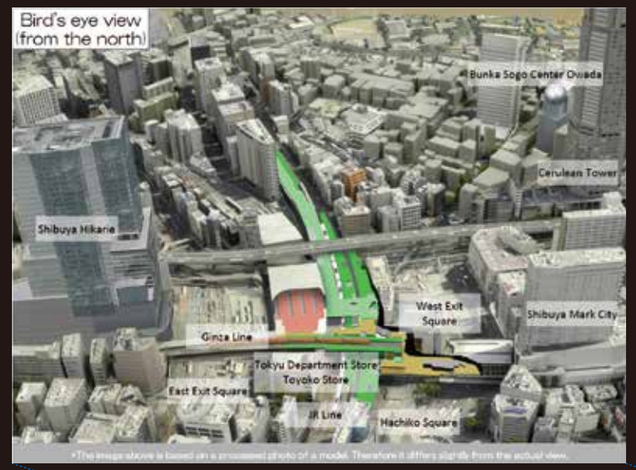
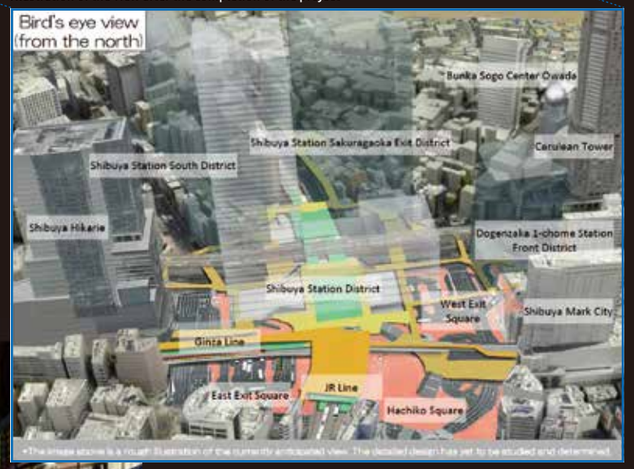


Illustration of the view after the completion of the project



Source: Shibuya project report (published by the government of Shibuya Ward showing the outline of the urban plan to redevelop the area around Shibuya Station) [June 2015]

Shibuya Bridge, a public promenade over Meiji-dori Street that links Shibuya Hikarie and Shibuya Station [Completion: 2012]

2012 Good Design Award

Planning the future of the city (Shibuya Station Area Redevelopment Plan)

An enticing future for the huge terminal in the city center is being created from different perspectives, including the attractiveness of the city and the convenience and comfort of the transport hub. The plan also includes the creation of a pedestrian-friendly space.

South Exit of Toyama Station: A design plan that integrates the station square, LRT and free passageways

A new symbol of Toyama was created along with the opening of Hokuriku Shinkansen [Completion: 2015]

Providing comprehensive coordination – from planning to design and construction in a complex project in front of a station or another place – from the viewpoints of flow of people, bustle, flow of vehicles, landscape, and the creation of a symbol of the city, among others

We provide complete support ranging from planning of the transport terminal, LRT, station square, unimpeded passage under the station building, urban planning procedures, and design and construction management.

Transport planning

We propose the future mobility of society which is in harmony with urban planning and supports the diverse activities of its people.

A land readjustment project for the reconstruction of a town in the Yuriage District of Natori City, which was damaged in the Great East Japan Earthquake

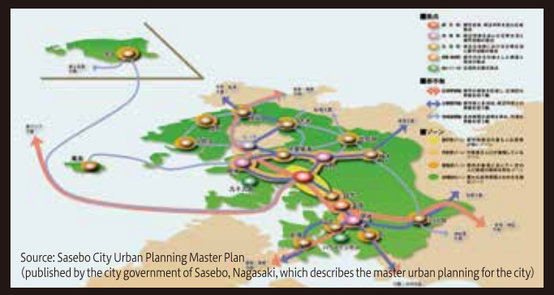
Fully supporting reconstruction efforts for areas affected by the Great East Japan Earthquake by working closely with the communities

- We began to support the local governments of the affected areas at an early stage by dispatching our engineers to the sites immediately.
- We comprehensively manage reconstruction projects beyond the conventional framework of consulting services.
- We have established local offices in four cities and towns that were affected by the disaster and are continuing to work hard for their reconstruction.

4th Nanashigure Mountain Trail Festival [June 2016]

A project for providing comprehensive support for the creation of businesses within a tourist attraction

Support for the sophistication and commercialization of regional resources based on a trail running theme and for the process of undertaking the activities as an autonomous initiative by the local community.



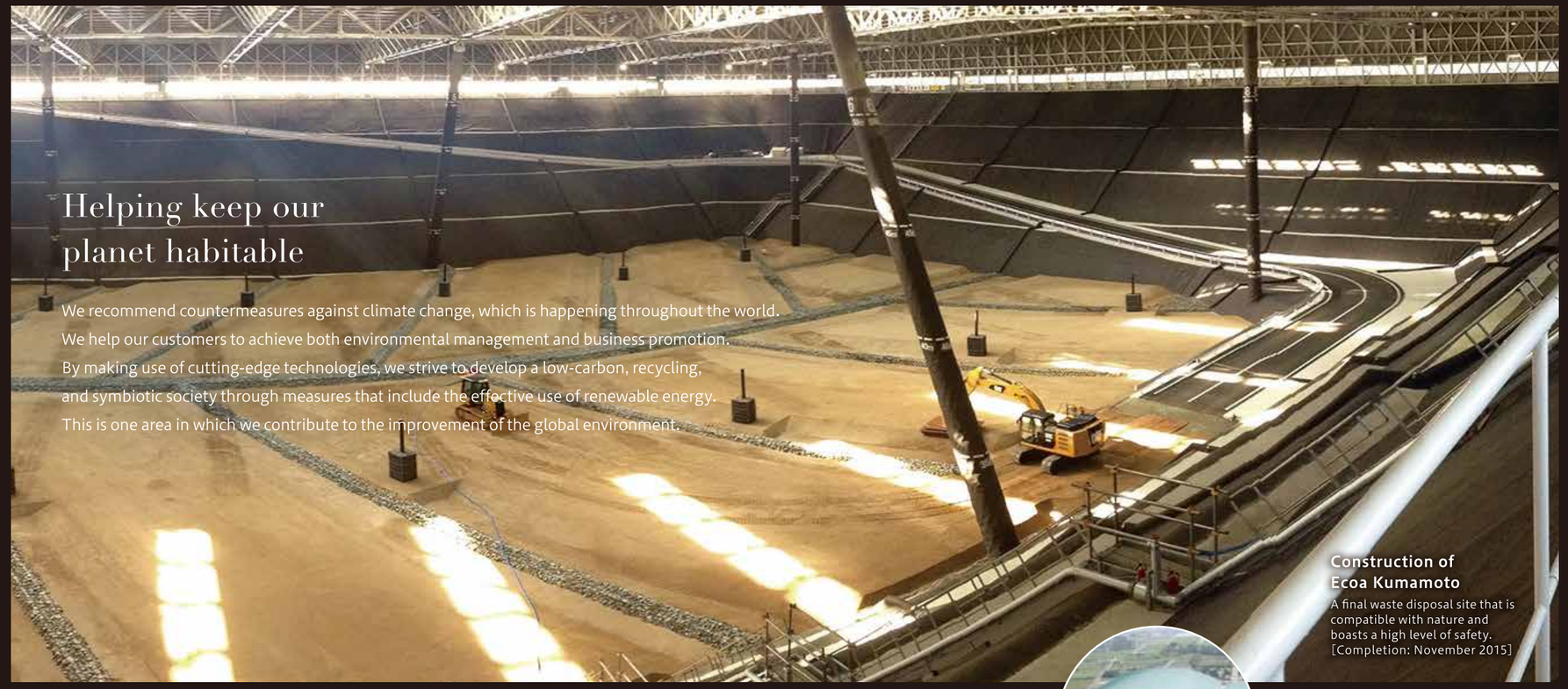
Source: Sasebo City Urban Planning Master Plan (published by the city government of Sasebo, Nagasaki, which describes the master urban planning for the city)

Creating the grand design for cities and communities

- Proposing the development of a ***multi-polar urban structure*** for regional revitalization in anticipation of declining national population.
- Coordinating between the government, citizens, business operators and experts for managing the process of sharing a vision for the future of the community.

Utilization of traffic simulation

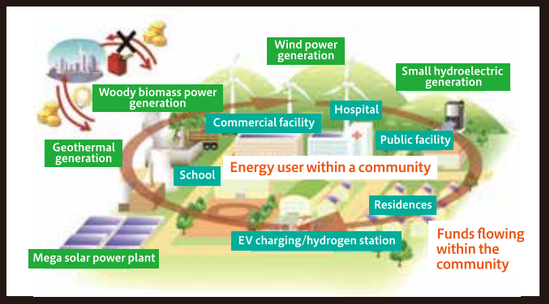
The actual traffic is simulated on a computer using a variety of large data from traffic and simulation models. In this way, the beneifits of various countermeasures against traffic congestion are compared in advance in order to select the most appropriate ones.



Helping keep our planet habitable

We recommend countermeasures against climate change, which is happening throughout the world.
We help our customers to achieve both environmental management and business promotion.
By making use of cutting-edge technologies, we strive to develop a low-carbon, recycling,
and symbiotic society through measures that include the effective use of renewable energy.
This is one area in which we contribute to the improvement of the global environment.

Construction of Ecoa Kumamoto
A final waste disposal site that is compatible with nature and boasts a high level of safety. [Completion: November 2015]



Support for the formulation of a vision for low-carbon urban development

We support the formulation of visions and planning of specific measures for low-carbon urban development, and the development of smart communities which create new relationships between *local resources, renewable energy, industries* and *people and their lives.*

04
Environment and Energy

Support for the introduction of renewable energy and energy-saving initiatives

We provide comprehensive support ranging from the selection of an appropriate site, project feasibility assessment and technological assessment for implementation and operational management.

A facility for producing woody biomass fuel

Lumber to be used for woody biomass production is being removed using high-performance forestry machines under our planning.

Support for local revitalization initiatives carried out using renewable energy

We recommend systems and project schemes which are effective for achieving local revitalization through renewable energy.

Support for the commercialization of geothermal energy generation in a hot-spring area

Illustration of a plan to use heat from a waste incineration facility

Support for local energy projects

To help develop a recycling and low-carbon society, we provide comprehensive support for projects to recover resources or energy from waste as well as local energy projects that use new energy or other energy sources.

Support for planning, design, construction, maintenance, and management and operation of intermediate waste treatment facilities and final disposal facilities

Incineration plant in West Hamamatsu City [Completion: January 2009]

Support for a global warming impact assessment and the formulation of an adaptation plan

We organized a symposium that was held to celebrate the establishment of the Climate Change Adaptation Platform, Japan.

Main content of the Climate Change Adaptation Platform, a portal site

Creation of content for guidelines to formulate adaptation plans and other documents

Measures for maintaining a good living environment for people

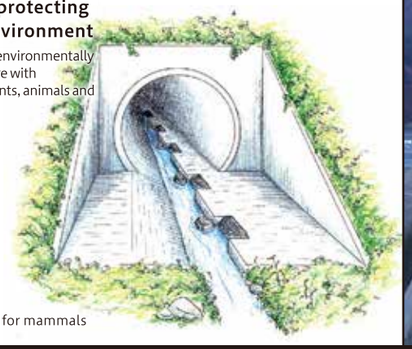
We conduct on-site surveys and analysis of noise, vibrations and other problems and recommend measures for maintaining a good living environment for people.

State-of-the-art advanced noise barrier
[Example of noise control measures]

Acoustic treatment of the underside of an elevated bridge
[An example of noise control measures]

Measures for protecting the natural environment

We plan and design environmentally friendly infrastructure with consideration for plants, animals and ecosystems.

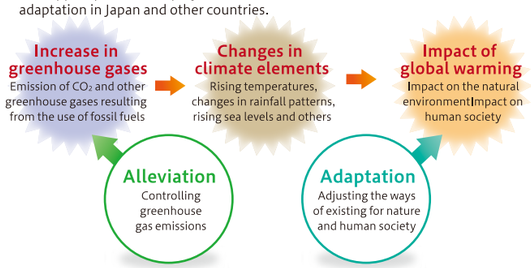


Securing pathways for mammals

Lighting designed in consideration of nesting sea turtles

Countermeasures against global warming (alleviation and adaptation)

We support policies and projects for both its alleviation and adaptation in Japan and other countries.



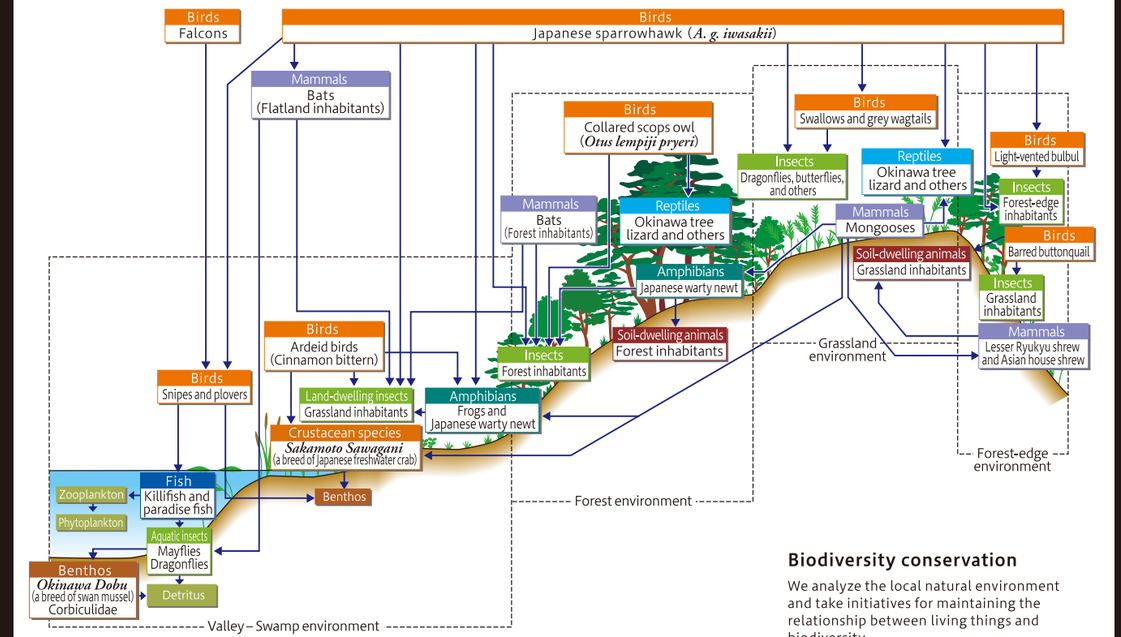
Source: Ministry of the Environment of Japan, Challenge to adaptation to prevent Japan from global warming*2012* (introducing specific projects and initiatives in Japan and other countries to adapt to the effects of global warming)

Support for developing countries to adapt to climate change (An international conference)

Implementation of renewable energy projects such as ones for solar power generation on islands

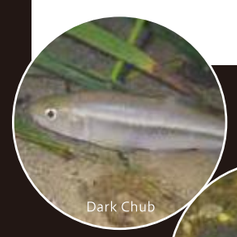
Designing projects for tackling environmental pollution in developing countries

04
Environment and Energy



Biodiversity conservation

We analyze the local natural environment and take initiatives for maintaining the relationship between living things and biodiversity.



Dark Chub

Rainbow trout

Survey of the natural environment

Checking that mammals, common birds, birds of prey, amphibians, reptiles, fish, plants and the community are in natural and good condition.

Survey of fish

Survey of birds of prey

Goshawk

Environmental DNA analysis, a new technology for biological surveys

An initiative for the practical realization of an innovative surveying method, identifying living things that inhabit aquatic environments with only water samples.

Efficient environmental surveys using UAVs

An initiative for efficient environmental surveys using UAVs, including ones for vegetation mapping and the confirmation the habitation of rare species of birds.

05
Architecture

Activity to invite and host international events/ Planning sports facilities

We have surveyed hundreds of sites in Japan and other countries and support activity to invite and host to host important international events.

Local facilities and exchange facilities that attract diverse people

We have created a large number of places where people gather, meet and make decisions.

Odakyu-Sagamihara Station and station square

We designed the integrated facilities including the square integrated with the station, a commercial facility, a pedestrian deck in front of the station and an unimpeded passage.

Integrating architecture with urban space Creation of integrated designs

Architectural space that links the architecture, city, people and civil engineering facilities - we provide optimal architecture solutions for future generations by fulfilling multiple requirements such as design quality, functionality and rationality.

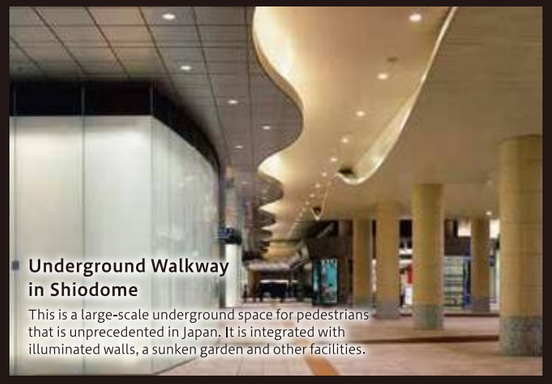
Shin-Tamana Station for Kyushu Shinkansen

A design that expresses the unique identity of the station with the hybrid structure of wood and steel beams.

11th Brunel Awards 2011

Buildings constructed during the redevelopment project for the area around Odakyu-Sagamihara Station

A redevelopment project integrating the construction of a commercial building in front of the station and a seismic-isolated high-rise apartment building for the area around the station.



Underground Walkway in Shiodome

This is a large-scale underground space for pedestrians that is unprecedented in Japan. It is integrated with illuminated walls, a sunken garden and other facilities.

Station square and unimpeded passage at Toyama Station

We proposed an unimpeded passage in the new Toyama Station, station square, waiting area and other facilities.

A multi-purpose community center in Ebina City

We have developed this complex facility in Ebina City for local people to interact and the promotion of good health.

Karasuyama Elementary School in Setagaya Ward

We proposed the design of a next-generation elementary school by including many enjoyable spaces from the viewpoint of children.

School lunch center in Fujimino City

This school lunch center was developed as a PFI project and applies the latest HACCP.

Shin-Hakushima Station building

We designed the new building for Shin-Hakushima Station and redeveloped the space around the station. [Opening: March 2015]

Protecting the ground environment by preventing ground disaster

Suffering frequent disasters from earthquakes and heavy rain, the islands of Japan are filled with resources including beautiful landscapes, underground water and geothermal heat.
We provide technical support for protecting local residents from ground disasters and maintaining and utilizing the rich ground environment.

06
Geotechnical Engineering

Protecting local communities from landslide disasters through district-based disaster control

We support initiatives for keeping mountains beautiful and making them resistant to landslides, based on an understanding of the slope failure risks that local residents might face from the mountains behind their houses.

Research and development for studying the mechanism of the occurrence of landslide disasters

To protect the lives and properties of local residents, we have developed technologies for assessing the level of risk of landslide disasters that can be offered to residents and government organizations.

Support for emergency response to, and recovery from, earthquakes and other disasters

By exercising our collective capabilities, we supported the reconstruction of roads around Mount Aso that were greatly damaged by the Kumamoto Earthquake.

Committee meetings

We support committee meetings including scholars for reviewing project policies or other purposes as necessary.

Testing of soil and rock

Long-duration exposure tests of excavated soil containing natural heavy metals and other substances.

Disposal of excavated soil

Handling of natural heavy metals, including surveys, risk assessment, and designs of countermeasure work.

Regional development through the effective use of natural energy

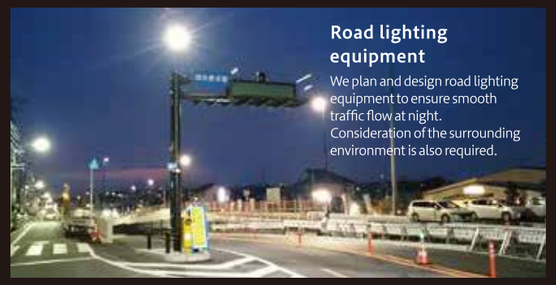
We provide technical support for regional development by making effective use of rich natural energy, while also trying to build a consensus with local communities.

Yamate Tunnel on the Central Circular Route

We have contributed to creating a safe, comfortable society by designing lighting and communication equipment and disaster prevention equipment for Yamate Tunnel and many other tunnels. [Opening: March 2015]

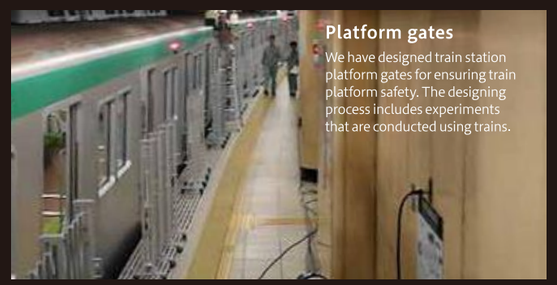
Road information equipment

We have also contributed to easing the traffic flow through planning and designing equipment that contributes to the provision and collection of road information.



Road lighting equipment

We plan and design road lighting equipment to ensure smooth traffic flow at night. Consideration of the surrounding environment is also required.



Platform gates

We have designed train station platform gates for ensuring train platform safety. The designing process includes experiments that are conducted using trains.

Smoke control systems for subways

We have planned and designed disaster prevention equipment, such as longitudinal smoke control systems for tunnels for many underground stations and subways in Japan and other countries.

Allocation of facilities in road tunnels

We plan various facilities for the inside of tunnels, which are essential for ensuring the safety of users and a smooth traffic flow.

Ventilation equipment for road tunnels

For many long tunnels in Japan, we have planned and designed ventilation equipment that is necessary for a safe tunnel environment.

Gyotoku Movable Weir

We retrofitted the old rolling gate into a roller gate.

Floodgates in Kesengawa River

In response to the Great East Japan Earthquake, we have designed five gates that are 34.2 m wide and 5m tall. The total length of the area with these floodgates is 200m.

07
Facility Engineering

Second High Tide Management Center of the Bureau of Ports and Harbors, Tokyo Metropolitan Government

We have designed a facility for the centralized remote monitoring and control of 19 floodgates managed by the Bureau of Ports and Harbors, Tokyo Metropolitan Government. These floodgates protect the coast of Tokyo Bay from tsunami and high tide.

Iron and manganese filtering device for spring water treatment system

To ensure effective use of tunnel spring water, we have designed a filtering device by studying the optimal method for removing iron and manganese from the spring water.

08
Business Development

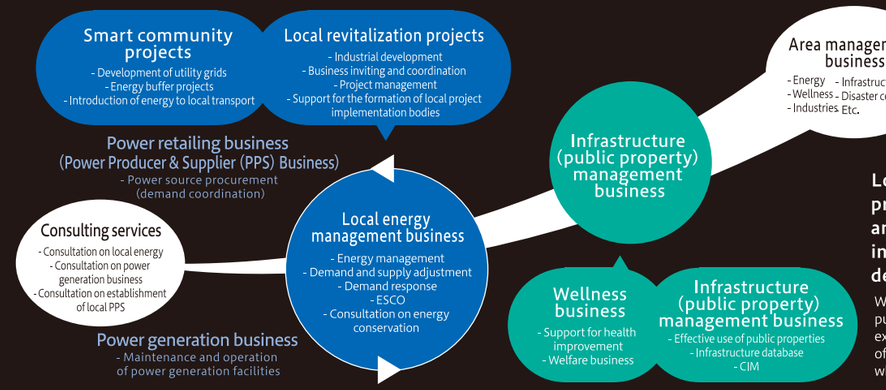
Power generation business (Tsukuba and Nishi Izu)
We have established PE-TeRaS Co., Ltd., a subsidiary engaging in power generation, and began to operate this power generation business in October 2013.

Creating projects together with local communities

In the field of highly public services, we operate projects for creating new value by working together with local communities.
In addition to providing the ***consulting*** services that we have cultivated so far, we participate in projects on our own as a ***project implementing body***.
We strive to be a consultant that understands projects and a company that is capable of operating projects in addition to providing consulting services.

Establishment and operation of *Harappa*, a facility for local revitalization (Miyagi Prefecture)
In Higashi-Matsushima City, Miyagi Prefecture, we began to operate a facility for local revitalization, which consists of a local product shop and a bakery.
[Opening: April 2016]

Operation of a roadside station (Shiga Prefecture)
As a designated administrator, we participate in the operation of *Seseragi no Sato Koura*, a roadside station which functions as a local center.
[Opening: April 2015]



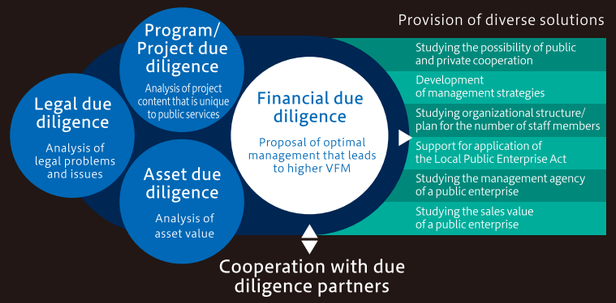
Local management services provided through public and private cooperation in the field of business development
We participate in projects for privatizing public services by taking advantage of our expertise in consulting services in the field of civil engineering and construction, which we have cultivated over many years.

Municipal PPS business
We have established new electric power companies, targeting regional development in various parts of Japan by cooperating with local governments and local business operators.

Wellness support business
The business of promoting good health in local communities based on wellness and support for management improvement in hospitals, care facilities and similar facilities.

Park management project (Chigasaki City)
We participate in the operation of the project including its design, overall control and operation for a period of 20 years as an SPC for a private finance initiative (PFI) project.
[Planned opening: March 2021]

Community-based project for childcare support
We help develop local childcare centers by making use of universities and private facilities and establish disaster prevention bases and networks for vulnerable people in time of disasters.



Consulting on the management of a public enterprise

We apply due diligence schemes cultivated in the private sector to the public sector, proposing optimal management.

Jingumae 1-chome *Minkatsu Saisei* Project (a project for revitalizing the private sector)

A PFI project that realized 1) urban development, 2) improvement, maintenance and management of a police station and 3) use of publicly owned land involving approx. 2.4-hectares of land owned by the Tokyo Metropolitan government.

Project for *Chiba-shi Omiya Gakko Kyusyoku Center* (tentative name meaning “school lunch center”)

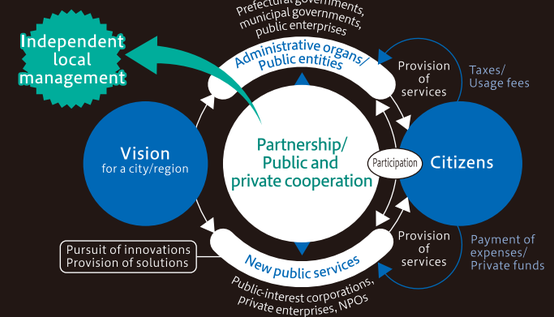
Japan’s first PFI project for a school lunch center in which the cooking of school lunches (11,000 served/day) is also included in the scope of business of the private sector.

Kurobe-shi Gesuido Biomass Energy Rikatsuyo Shisetsu Seibi Unei Jigyo (A biomass energy utilization project for a sewage treatment plant, Kurobe City)

A PFI project that created a facility where wastewater sludge, food residue and other waste are treated for methane fermentation using the gas generated in the process.

Yotoukugakusha Improvement Project

The prefectural government of Nara rebuilt a student dormitory that it owns in a city center by making use of surplus land (fixed term land lease rights) without taking on a new financial burden.



Consulting on local revitalization projects

Support for independent local management, including the establishment of a public and private cooperation project for creating attractiveness or vitality for a local community.

Consulting on public facility management

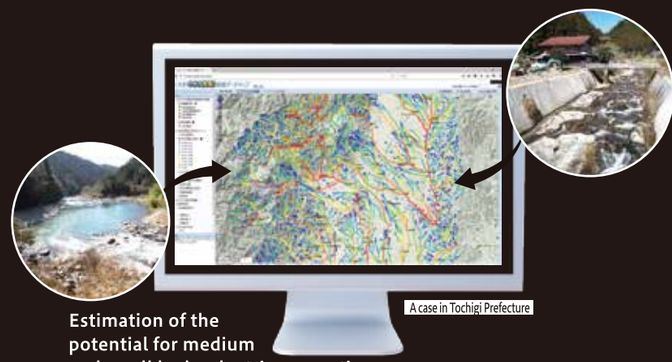
We realize facility redevelopment in response to social changes by questioning once again the form public facilities should take and creating opportunities for the private sector to enter the area of public projects.

Consulting on administrative management

We establish optimal governance by supporting the formulation of administrative plans, including plans for resolving information asymmetry and plans for harmonizing the autonomy of citizens with market principles.

09 Public Management

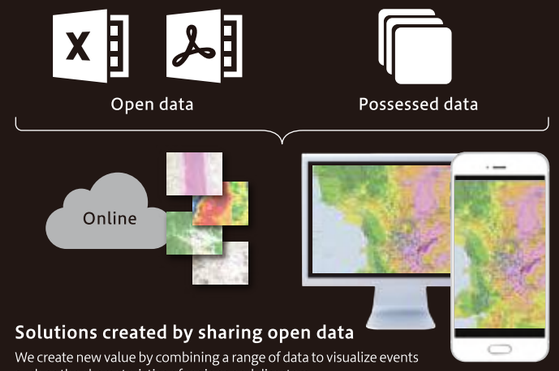
10 Information System



Estimation of the potential for medium and small hydroelectric generation

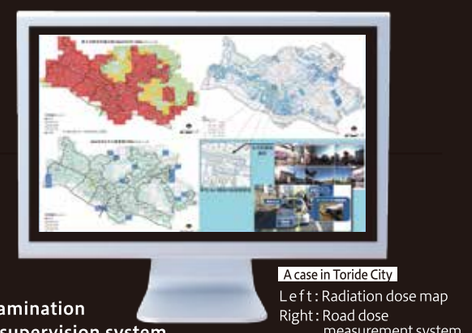
A case in Tochigi Prefecture

The potential for medium and small hydroelectric generation is estimated and shared via GIS for promoting the use of natural energy.



Solutions created by sharing open data

We create new value by combining a range of data to visualize events such as the characteristics of regions and disasters.



Decontamination project supervision system

A case in Toride City

Left: Radiation dose map
Right: Road dose measurement system

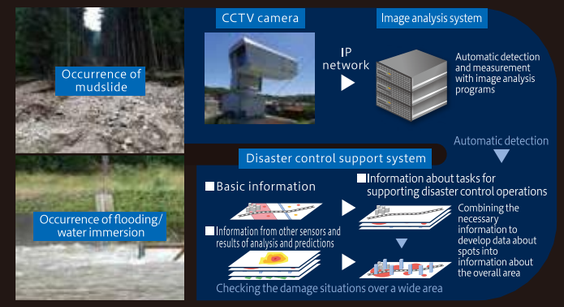
We have developed a supervision system to improve the efficiency of decontamination projects and visualize their achievements.

Forest information system

We develop and operate systems that support forestry operations with GIS and cloud computing technologies, in order to manage forests appropriately.

Road Patroid

We provide an application for supporting the inspection of roads by patrol, which can be used on commercially available smartphones and tablets. It can improve the efficiency of on-site input of information about abnormal events, automatically create patrol logs, and use data on abnormal events accumulated in the database for patrol plans, etc.



Advanced monitoring technology featuring the use of image analysis

We provide solutions with automatic detection technologies featuring image recognition, aiming for the advanced utilization of images from surveillance cameras and other equipment.

Promotion of smart forestry

We promote smart forestry, which applies ICT and G-Space technologies, for developing forestry as a key element of regional revitalization.

Railroad project

Management of MRT construction in Jakarta

Jointly with local staff we managed the construction of a 16km long railroad including a subway, which was the first of its kind in Indonesia.

Applying technologies cultivated in Japan to projects worldwide

We apply technologies and experience accumulated in Japan to projects worldwide, with a focus on emerging and developing countries. These include the creation of transport systems such as ports, railroads and airports, energy development, disaster control, water business, waste treatment in urban areas, support for projects that contribute to countermeasures against global warming, energy conservation and the reduction of the environmental load and the implementation of projects that use private funds.

11 Overseas

Disaster prevention project

Project for the rehabilitation and reconstruction of Nepal from the earthquake

We provided comprehensive support for the construction of a disaster-resistant country, targeting the early rehabilitation and reconstruction of areas affected by the Nepal earthquake.

Transport project

Philippines: Delivering traffic congestion information using digital terrestrial broadcasting technology

Japan's digital terrestrial broadcasting technology is used in 18 countries worldwide. We studied the possibility of introducing the system as a means of delivering traffic congestion information, emergency information and more.

Source: Data on FY2015 verification project by International Economic Affairs Division, Ministry of Internal Affairs and Communications

Development project

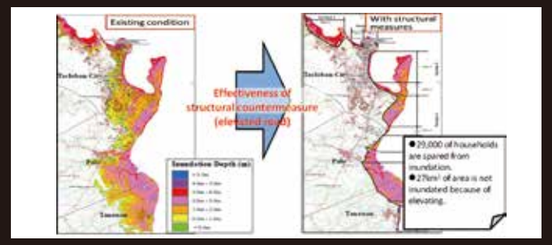
Study of the possibility of spreading D-BOX, a reinforcement material for very soft ground, and its demonstration experiment

We conducted a demonstration experiment for D-BOX in a delta area in Myanmar, which was highly effective for reinforcing the ground, and a survey on the need for it. (The order was placed by the Ministry of Foreign Affairs.)

Water project

Survey of needs aimed at spreading small-scale water purification systems

In the suburbs of the metropolitan areas of Indonesia, Cambodia, India and Kenya, we studied the possibility of spreading water purification technologies via Japan's ODA.



Disaster prevention project

Philippines: Project for supporting rehabilitation and reconstruction from damages caused by Typhoon Yolanda

We participated in the creation of a project for reconstruction from damages from the high tides and strong winds caused by Typhoon Yolanda, a super typhoon that occurred in November 2013 (in the Project on Rehabilitation and Recovery from Typhoon Yolanda for JICA).

Energy project

Introduction of a solar power generation system to a commercial facility in Palau

We supported the introduction of a solar power generation system that was carried out using a subsidy from the Ministry of the Environment of Japan. The system uses a highly efficient solar cell module and a 24-hour monitoring system of a Japanese company.

Development project

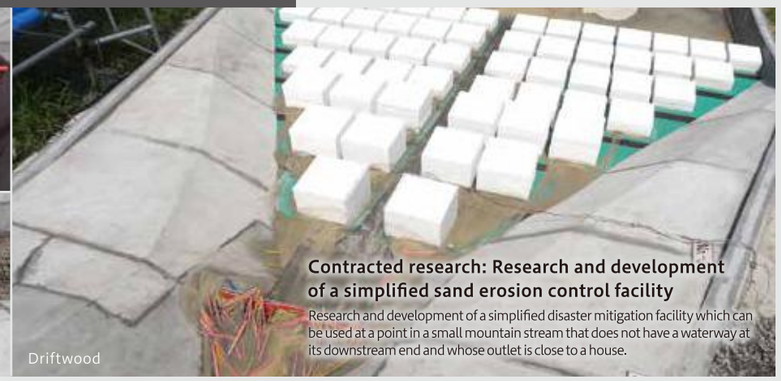
Design of Japan's first canoe slalom venue

We designed an artificial canoe slalom course for international competitions. We conducted a hydraulic model experiment at Czech Technical University to maximize the excitement of canoe slalom competition, the aim of which is to negotiate the white water rapids defined by gates in the shortest possible time.

Technology development at experimental facilities


Simplified disaster mitigation facility


Mudslide


Driftwood

Contracted research: Research and development of a simplified sand erosion control facility

Research and development of a simplified disaster mitigation facility which can be used at a point in a small mountain stream that does not have a waterway at its downstream end and whose outlet is close to a house.

Bridge pier scouring by tsunami

When a tsunami acts on bridge piers located downstream from a river, scouring of the piers occurs on both the upstream and downstream sides due to the ***spilling wave*** and ***undertow***. We conduct channel experiments on pier scouring by tsunami.

A bridge pier that was damaged by tsunami scouring.

Hydraulic jump

Channel experiment

Development of technologies for a flood fighting engineering method that uses guard rails

We examined the performance needs of technologies for a flood fighting engineering method as an emergency measure against a flood exceeding the designed level in an urban area.

Mounted on a guard rail

12

Research and Development

Tsukuba Research Center

At this research center, which is located on an approx. 4-hectare site, we conduct research and development in many different fields such as rivers, dams, sand erosion control, coasts, ports, water supply and sewage and the environment. In the large, approx. 2,000-square-meter indoor experimental facility, we conduct hydraulic model experiments on dams, coastal levees, sewerage and other facilities, as well as analyses of water quality and soil. The facility was constructed using the Strarch method that has no pillar and is 45m long, 42m wide, and 10m tall, and has a flexible space for research and development.

Technology research: List of papers

FY2016

No.		Research topic	Author		Remarks
1	Port	Fundamental Study on the Simple Seismic Performance Design of Pier Considering Foundation Deformation	Land Conservation	Akihito TERASHIMA	Journal of JSCE B3 (Ocean development), Vol. 72 (2016) No. 2
2	Port	Numerical Analysis on New Dike Back Slope Shape to Reduce Scouring at the Landward Tow Caused by the Tsunami Overflow	Land Conservation	Masanori ISHIKAWA	Journal of JSCE B3 (Ocean development), Vol. 72 (2016) No. 2
3	Port	Study to Understand the Condition of Superstructure of a Disaster-Stricken Pier by Using an Electromagnetic Rader	Land Conservation	Nobukazu SASAKI	Journal of JSCE F5 (Safety problems), Vol. 72, No. 2
4	River	Discussions about Sustainable Forest Management Measures Based on Indexes of Transverse Characteristics and Planar Characteristics	Land Conservation	Hiroki YOSHITAKE	Advances in River Engineering, Vol. 22, June 2016
5	Environment	Solutions in Climate Change Impact Assessment and Adaptation Planning in Local Governments: Analysis and Consideration on Results of Assistance Project for 11 Model Local Governments	Environment and Energy	Kumiko KAJII	Chikyu Kankyo Vol. 21, No. 2/ 2016
6	Information	Study of Advanced Examples Related to Smart Forestry and Prospects of Business Models Related to Smart Forestry	Information System	Hisashi NAKAMURA	Shinrin Kagaku No. 78
7	Environment	Radioactive Decontamination Project (Residential Areas and Roads) in Toride City, Ibaraki Prefecture	Environment and Energy	Masahiro FURUMATSU	Journal of the Society for Remediation of Radioactive Contamination in the Environment, Vol. 4, No. 3, pp. 269-281, 2016
8	Transport	Changing Mobility Patterns in Tokyo	Urban Planning	Daisuke OSHIMA	22nd ITS World Congress, Bordeaux, France, 5-9October 2015
9	Structure	Remaining Strength Evaluation of Plate Girders with Corrosion Near Supports	Transport Infrastructure	Naoyuki ASAO	INTERNATIONAL STRUCTURAL ENGINEERING AND CONSTRUCTION SOCIETY · ASEA-SEC-3
10	Port	Analysis of the Effects of Countermeasures for Coastal Erosion in Cua Dai Beach, Central Vietnam	Land Conservation	Tsuyoshi NAGASAWA	Proceedings of the Vietnam-Japan Workshop on Estuaries, Coasts, and Rivers 2016,Ho Chi Minh City, Vietnam September 20th 2016

FY2015

No.		Research topic	Author		Remarks
1	River	Accuracy of Velocity and Discharge Evaluated with a Dynamic Interpolation and Extrapolation Method under Various Conditions	Land Conservation	Jin KASHIWADA	Journal of JSCE B1 (Hydraulic engineering), Vol. 71 (2015.2), No. 4
2	Environment	Evaluation of the Impact of Climate Change on Water Quality in Dam Reservoirs for Drinking Water and the Adaptation Capacity of Water Utilities	Land Conservation	Yoshihiko KAWAMOTO	Journal of JSCE G (Environment) Vol. 71, No. 5 (2015)
3	Transport	Evaluation of the Effects of Adaptive Cruise Control on Drivers' Acceptance for Driving in Keeping Left Lanes on an Expressway	Urban Planning	Kosuke YAMADA	35th Japan Society of Traffic Engineers Proceedings (2015.5)
4	Geotechnical Engineering	The Effects of the Degree of Mountain Denudation on Soil Layer Structure, Shallow Landslide Properties on Granite Area in Japan	Geotechnical Engineering	Makoto MATSUZAWA	Transactions, Japanese Geomorphological Union 36-1 (2015)
5	Structure	Design of Takimi Footbridge Locating the World Heritage Shiraito Falls	Transport Infrastructure	Daisaku ISHIHARA	IABSE Conference Nara,AD-10(2015.5)

FY2014

No.		Research topic	Author		Remarks
1	Quake resistance	Study on Dynamic Behavior of Steel Cellular-Bulkhead Quaywalls during Earthquake	Transport Infrastructure	Shigeru SATO	Journal of JSCE A1 (Structural/earthquake engineering)
2	River	Experimental Study on the Flow Characteristics in a Bending River Section with a Cut-Off Channel	Land Conservation	Makoto ICHIYAMA	Journal of JSCE B1 (Hydraulic engineering) (2014.2)
3	Transport	Occurrence Condition of Gridlock Phenomenon on a Single Grid Network	Urban Planning	Daisuke OSHIMA	Journal of JSCE D3 (Civil engineering project)
4	Quake resistance	Maintenance Strategy of Deteriorating RC Bridge Piers in Consideration of Seismic Risk	Transport Infrastructure	Hisaya FUJII	Journal of the Society of Materials Science, Japan
5	Geotechnical Engineering	Landslide Sites Controlled by the Denudation Front and Weathering Intensity Shallow Landslides Induced by Rainstorms in the Area Underlain by the Cretaceous Izumi Group, Ehime Prefecture	Geotechnical Engineering	Makoto MATSUZAWA	Journal of the Japan Society of Engineering Geology, Vol. 55, No. 2 (2014)

FY2013

No.		Research topic	Author		Remarks
1	Port	Analysis of the External Forces and Factors Which Caused the Destruction of the Revetments due to the Tohoku-Pacific Ocean Earthquake and Tsunami	Land Conservation	Tsuyoshi NAGASAWA	Journal of JSCE B2 (Coastal engineering), Vol. 69, No. 2 (2013)
2	Port	Experimental Study on Effects of Reinforcement for Caisson Breakwaters against Abnormal Tsunami	Land Conservation	Daiki TSUJIO	Journal of JSCE B3 (Ocean development), Vol. 69, No. 2 (2013)
3	Disaster control	Assessment of Impacts of Natural Disasters on Water Supply Utilities Using Hazard Maps	Land Conservation	Yasuyo YOSHIKAWA	Journal of JSCE G (Environment), Vol. 68, No. 7 (2012)
4	Disaster control	Risk Control Measures against Flooded Damage to Business Premises	Land Conservation	Syunji TAKANISHI	*Doboku Gakkai Kasen Gijutsu Ronbunshu* (Journal of JSCE on River engineering), Vol. 19 (2013.6)
5	River	Accuracy for Discharge Monitoring of Various Velocimetric Tools Using a Unified Technique for Interpolation and Extrapolation of Velocity	Land Conservation	Jin KASHIWADA	Annual Journal of Hydraulic Engineering Vol. 57 (2013.3)
6	Quake resistance	Liquefaction-induced Damage to Structures during the 2011 Great East Japan Earthquake	Transport infrastructure	Shigeru SATO	Journal of JSCE, Vol.1 (2013)

FY2012

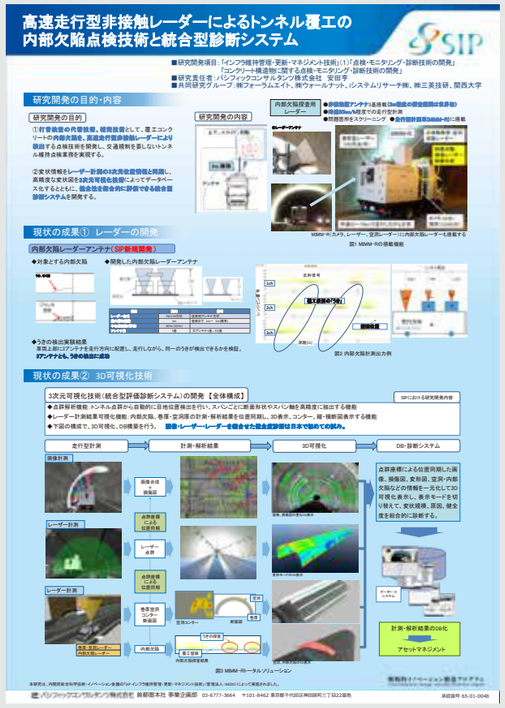
No.		Research topic	Author		Remarks
1	Port	A Study on Improvement of the Cross Section Setting Method of Open Type Wharves against Level-Two Earthquake Ground Motion	Land Conservation	Kenichirou MIYASHITA	Journal of JSCE B1 (Ocean development)
2	Port	Analysis of Structural Damages with Massive Geomorphic Change due to Tsunami	Land Conservation	Tsuyoshi NAGASAWA	Journal of JSCE B2 (Coastal engineering)
3	Port	Application of High-Order Nonlinear Boussinesq Wave Model Considering Wave Run up to Field Coastal Areas	Land Conservation	Yosuke OKUBO	Journal of JSCE B2 (Coastal engineering)
4	Port	A Study on the Target Safety Level of Breakwaters against Wave Force	Land Conservation	Daiki TSUJIO	Journal of JSCE B2 (Coastal engineering)
5	Environment	Development of Methods for Systematization of Adaptation Technologies to Climate Change in the Asia Pacific Region	Environment and Energy	Kumiko KAJII	Journal of JSCE G (Environment) Vol. 68, No. 5
6	Conservation	Maintenance Planning of Deteriorating Highway Bridges with Seismic Risk	Transport Infrastructure	Hisaya FUJII	Journal of the Society of Materials Science, Japan, February 2012 Issue (Vol. 61, No. 2)

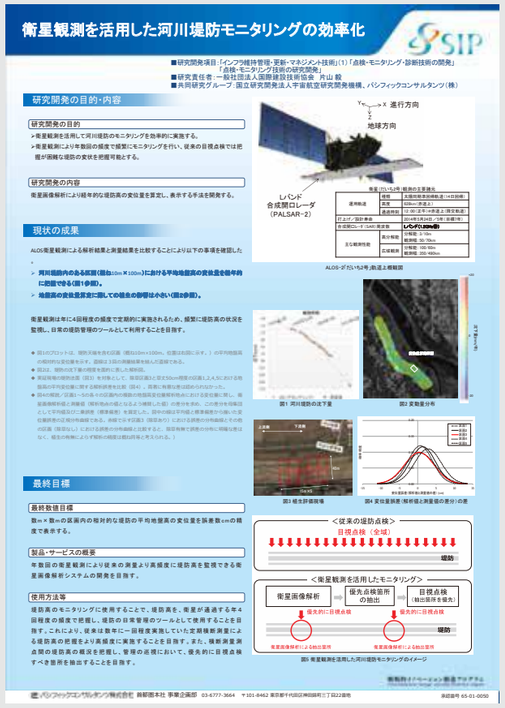
Participation in the Cross-ministerial Strategic Innovation Promotion Program (SIP)

SIP is a national project for science, technology and innovation that is spearheaded by the Council for Science, Technology and Innovation beyond the conventional framework of government ministries and traditional disciplines. Pacific Consultants addresses a number of issues under this project.

12
Research and Development

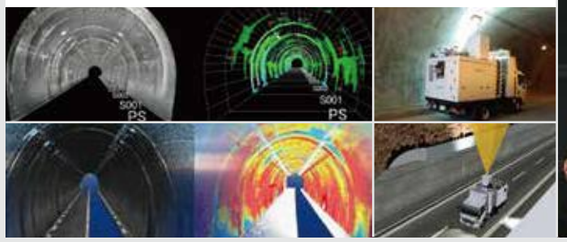
SIP Issue	Project name	Field	Project description	Orderer
Automated Driving System	Research and studies concerning controllability of next-generation urban transport systems in research and studies related to issues in realization of the "SIP Automated Driving System" and direction of solutions of the issues	Traffic policy	Conducting research and studies about requirements fulfilled by the in-car PTPS device by cooperating with measures related to the SIP Automated Driving System.	Minister's Secretariat, Cabinet Office
	2015 Cross-Ministerial Strategic Innovation Promotion Program (Study and research of local traffic CO_2 emission visualization technology)	Traffic policy	The project is aimed at promoting the practical application and spread of automated driving systems by establishing technology for quantitatively visualizing the effects of the system on the reduction of CO_2 emissions.	Minister's Secretariat, Ministry of Economy, Trade and Industry
Infrastructure Maintenance, Renovation, and Management	Cross-ministerial Strategic Innovation Promotion Program (SIP)/Technologies for infrastructure maintenance, renovation, and management/On-site demonstration of the monitoring system/Research and development of a simplified system for monitoring the airport pavement surface using maintenance vehicles	Airport	Developing simplified systems for measuring and detecting the defects of airport pavement surfaces and developing a monitoring system which enables checking for the distribution of deteriorated surfaces, deterioration with age of the pavement surface and other conditions of the overall airport using the above simplified systems. *This project is implemented jointly by the University of Tokyo, Pacific Consultants and Social Capital Design.	New Energy and Industrial Technology Development Organization (NEDO)
	Cross-ministerial Strategic Innovation Promotion Program (SIP)/Technologies for infrastructure maintenance, renovation, and management/Study on practical use of inspection and diagnostics technique/Development of internal defect inspection for tunnel lining using high-speed mobile-type non-contact radar and integrated soundness assessment systems	Tunnel	The purpose of this project is to develop inspection technology for detecting defects in concrete using rapidly scannable non-contact radar. It is also aimed at developing a synthetic diagnosis system which permits the comprehensive assessment of the durability of concrete as well as the compilation of a database of highly accurate drawings of different unsound conditions, including defects, hollowness and inner defects, using a 3D visualizing technology.	New Energy and Industrial Technology Development Organization (NEDO)
	Improving the efficiency of river embankment monitoring by applying satellite observation	River	Demonstrating technology for checking the displacement of a river embankment using time series analysis based on data from multiple satellites by applying SAR interference technology.	Minister's Secretariat, Ministry of Land, Infrastructure and Transport
Enhancement of Societal Resiliency against Natural Disasters	Development of a real-time inner water inundation information system for medium- and small-sized rivers in urban areas	River	Developing a system for delivering information about predictions and monitoring of flooding caused by torrential rain on medium- and small-sized rivers in urban areas, reflecting consideration of the fact that research on countermeasures against flooding is conducted, with input conditions being the results of prediction of torrential rain by the High-resolution Precipitation Nowcasts or the Phased Array Radar.	Ministry of Land, Infrastructure and Transport National Institute for Land and Infrastructure Management





Development of a technology for tunnel measurement using a mobile imaging and mapping system (MIMM-R)

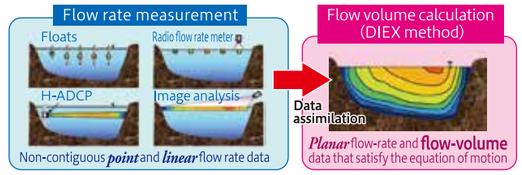
Development of a synthetic diagnostic system aimed at improving the efficiency and reliability of tunnel inspections by creating results with visualization technology, such as three-dimensional images, point groups, damage diagrams and modification contours, by means of image shooting, laser measurement and radar probing.



From the left: Toru YASUDA [Transportation Infrastructure Div.], Akihiro OTA [Minister of Land, Infrastructure and Transport], Shinichi HASEGAWA [President of Pacific Consultants]
*The positions of the persons were current as of the award presentation.

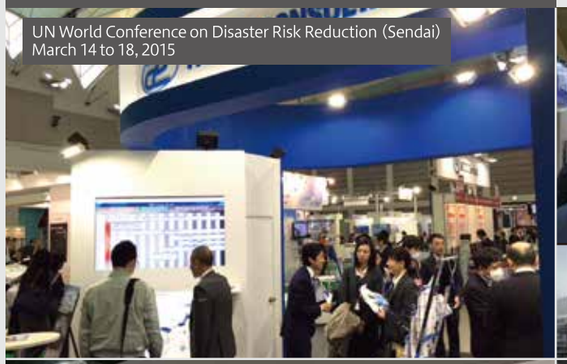
Development of technology for analyzing river flow volume

We have developed a Dynamic Interpolation and Extrapolation (DIEX) method, which enables the conversion of non-contiguous ***point*** and ***linear*** flow rate data obtained through on-site observation into ***planar*** flow-rate and flow-volume data in a way that satisfies the equation of fluid motion. This method enables high precision of flow volume calculation to be maintained while reducing the number of flow-rate observation data, thereby enabling efficiency improvement, cost reduction and higher precision of flow volume observation.



From the left: Jin KASHIWADA [Land Conservation Div.], Hideo NAKAMURA [Chairman of the selection committee], Yasuo NIHEI [Professor of Tokyo University of Science]
*The positions of the persons were current as of the award presentation.

Participation in international conferences

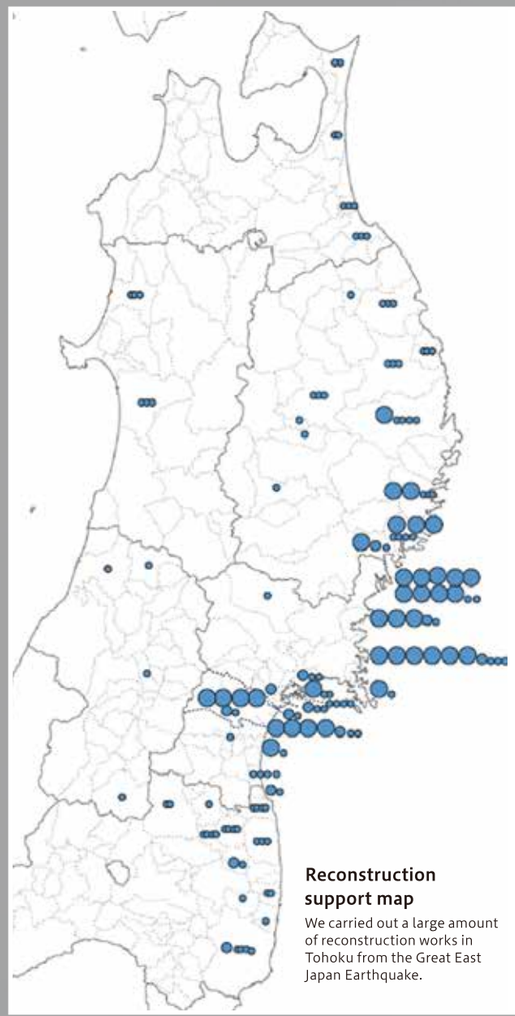


Appendix 01

Reconstruction from the Tohoku Earthquake

Developing towns with a focus on safety and security using the experience from the earthquake as the driving force for reconstruction efforts

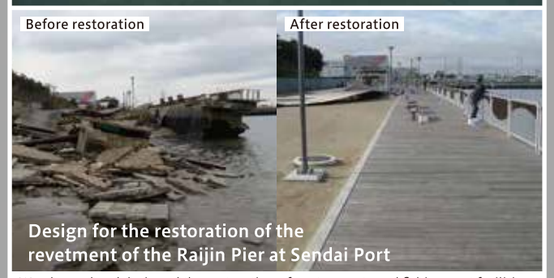
Immediately after the 2011 earthquake off the Pacific coast of Tohoku, we began our activities by giving top priority to cooperation with the reconstruction efforts in the affected areas. We have since been engaged in a wide range of initiatives and support activities for the restoration and reconstruction, including support for the formulation of a reconstruction plan, social infrastructure restoration and disaster waste disposal, not to mention emergency measures.
Among these, we place a particular emphasis on the recovery of the local industrial infrastructure for accelerating reconstruction and make appropriate proposals for the actual conditions in local communities that will also revitalize them.



Reconstruction support map
We carried out a large amount of reconstruction works in Tohoku from the Great East Japan Earthquake.

Supervision of reconstruction work on embankments at the mouths of the Kitakamigawa and Narusegawa Rivers

Design for the restoration of the coastal embankment on the Takata Coast



Design for the restoration of the revetment of the Raijin Pier at Sendai Port

We planned and designed the restoration of ports, coasts and fishing port facilities that were devastated by the Great East Japan Earthquake.

Sanriku coastal road

Kamaishi Chuo IC (exit)

Implementation of the Kamaishi-Yamada Koku (zone), a project promotion PPP that was applied in the early redevelopment of the Sanriku coastal road.

Construction of a temporary bridge for the Koizumi-ohashi Bridge on Route 45

Restoration of the Sanriku Railway Minami-Rias Line

Fully supporting reconstructing efforts for areas affected by the Great East Japan Earthquake by working closely with the communities

- We began to support the local governments of the affected areas at an early stage by dispatching our engineers to the sites immediately.
- We comprehensively manage reconstruction projects beyond the conventional framework of consulting services.
- We have established local offices in four cities and towns that were affected by the disaster and are continuing to work hard for their reconstruction.

Reconstruction of Ofunato city center


Kesennuma: A plan to reconstruct the area around Oya Beach [Proposal examined in 2012]


Minami-Sanriku: Providing full support for the town as PMC


A land readjustment project for the reconstruction of a town in the Yuruage District of Natori City, which was damaged in the Great East Japan Earthquake

A pedestrian bridge in the reconstruction project for Minami-Sanriku Town (rendering)


Supervision of decontamination work

Monitoring of decontamination work

Support for decontamination work

Reconstruction from Hiroshima Landslides

Emergency response to the disaster caused by torrential rain in Hiroshima

Before dawn on August 20, 2014, localized torrential rain hit Hiroshima City and caused a large-scale mudslide disaster. In response, to ensure early recovery, we conducted on-site surveys to confirm the affected points and planned and designed methods for emergency restoration work.

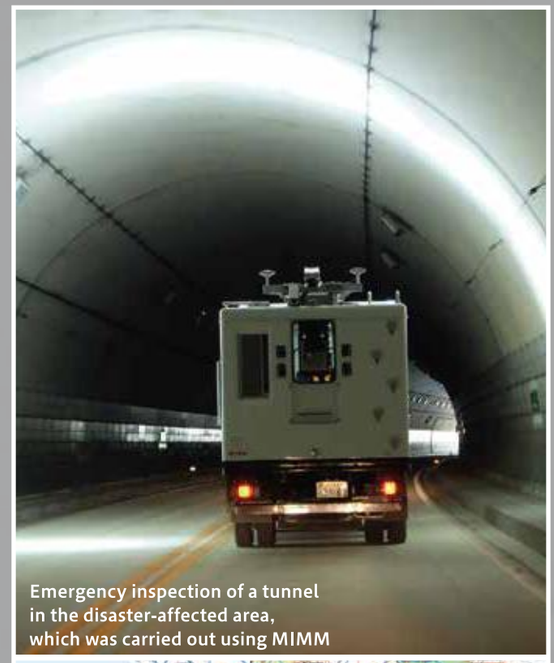

On-site check of a disaster-affected area

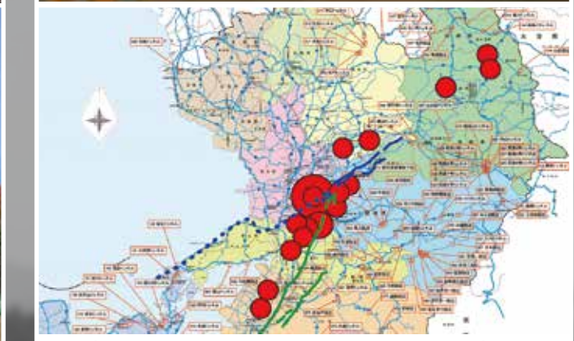

Construction work as a countermeasure against mudslides (mudslide-control dam)

Reconstruction from the Kumamoto Earthquake

Checking the damages and expanded damages using the Mobile Imaging Technology System & Mobile Mapping System (MIMM)

Major earthquakes centered in the Kumamoto Region of Kumamoto Prefecture occurred on April 14 and 16, 2016. We checked the status of damage in 60 of about 170 road tunnels in the region through emergency tunnel inspections as CSR activities.

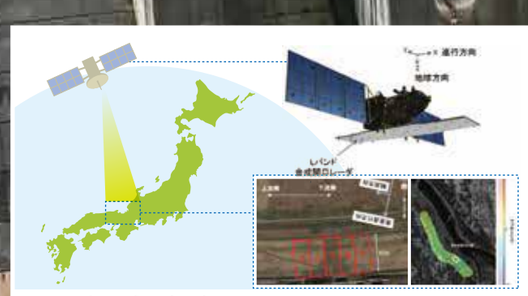

Emergency inspection of a tunnel in the disaster-affected area, which was carried out using MIMM


The fault zone, earthquake center and locations of tunnels that were subject to the emergency inspection

Appendix 02

Infrastructure maintenance and management

In recent years, the importance of countermeasures against the aging infrastructure and its maintenance and management has been expanding rapidly. Based on our achievements and experience in operations including inspection, survey, soundness evaluation and infrastructure asset management, we are actively working on efficient, effective infrastructure maintenance and management by making use of new inspection and survey technologies that apply a variety of information and communication technologies and knowledge.



Inspection of embankments

River embankments are monitored using satellite observation. The amount of changes in the height of the embankments over time is calculated by analyzing images from the Advanced Land Observing Satellite (ALOS). This method is being developed jointly with SIP.

Visual and hammering inspections conducted close to the subject structure

Visual and hammering inspections are conducted as regular inspections. They are conducted near the subject structures through an aerial work platform or similar equipment.

Diagnosis of long-span bridges

We conduct detailed surveys of the damage to the cables and main girders of PC cable-stayed bridges, which are assumed to be caused by the vibrations of diagonal cables.

Tunnel inspections

We conduct image measurement using a video camera, shape measurement using high-precision laser and measurement of a tunnel lining's thickness, hollowness and inner defects using non-contact radar. These measurements are conducted by travelling through each tunnel. The damage map, modification contours and information about inner defects are displayed as 3D images.

Airport pavement inspections

The efficiency of airport pavement inspections and surveys has been improved using a simplified measurement system, a vehicle equipped with a camera and an infrared sensor. This system was developed jointly with SIP. The vehicle used in the measurement is towed by an administrative vehicle for inspection rounds. The photo below shows a navigation guide that is projected on the road with a projector.

Work for protecting concrete surfaces and preventing falling (Skeleton Method)

This method features a transparent coating, which facilitates a visual check of the concrete surface after the work. The coating is also steam permeable. It releases excess moisture, thereby preventing deterioration. Because the use of primer is not necessary, this method ensures faster completion of work than conventional coating methods. We conduct this work in a business alliance with mbs, Inc.

Index

01 Land Conservation

Watershed management
Comprehensive solutions for various problems with watersheds, from water sources to coastal areas (basin hydrological cycle, material cycle, national land with water information, water quality conservation, implementation of improvement measures and other services)

Rivers, dams and erosion control
Survey, planning, design and hydraulic tests in the field of rivers, dams and erosion control (flood control planning, river development planning, design of embankments, revetments, dams, flood gates and other facilities, comprehensive sediment control, hydraulic tests and analysis, irrigation plans and other services)

Sea, coast and ports
Survey, planning, design, CM, construction supervision and other services related to marine technologies, such as harbors and fishing ports, coastal protection, sea embankments (tsunami analysis and embankment planning) and seafront development

Water supply and sewage
Services related to the water business (support for privatization including water supply management support and management plans for water purification), services related to surveys, planning, design (business plans, renewal, diagnostics and reinforcement design of seismic and tsunami-proof construction, effective use of sludge digestion gas and others) and management (management, management support, asset management, GIS, PFI, PPP and others) in the field of water supply and sewage and other services

Disaster risk reduction and management, crisis management
Surveys of natural disasters such as earthquakes, tsunamis and wind and flood damage and social disasters such as terrorism, disaster risk reduction and management planning (crisis management plans, regional disaster risk reduction and management plans and BCP), planning of disaster drills, construction of disaster risk reduction and management information systems and other services

02 Transportation Infrastructure

Roads
Works related to road traffic policies (such as road network planning, traffic estimation, traffic simulation, development effect analysis and project evaluation), works related to road development, improvement and maintenance (road development planning, road design, roadside environment development planning, bicycle and pedestrian space planning, measures against traffic congestions and traffic accidents, consensus building support and road maintenance planning), supervision of road-related projects (supervision of PPP projects, survey design and construction) and other services

Construction
Survey, planning, design (including seismic and landscape design) and analysis of bridges (including roads, railroads, new transportation and pedestrian decks), elevated bridges (roads and railroads), earth structures (such as retaining walls and box culverts), crossing structures (overbridges, overpasses, pedestrian bridges and underpasses), river and port structures (such as flood gates, sluice gates, maritime piers, embankments and special embankments) and a variety of other construction; structural health surveys, bridge inspection, structure maintenance planning, construction management and other services

Tunnels
Surveys, planning and design of open cut tunnels (ones on roads and railroads), shield tunnels (including ones on roads, railroads and underground rivers), mountain tunnels (ones on roads and railroads), utility tunnels, underground car and bicycle parking lots and other underground construction; inspection of tunnel construction (measurements carried out by travelling in each tunnel), plans to extend tunnel life, construction management and other services

Railroads
Route and wiring planning of railroads, LRT and new transportation systems; surveys, planning, design and maintenance of newly constructed station buildings (bridge stations and ground and underground stations), improved station buildings (platform extension and installation of platform safety fences), rolling stock bases and other facilities; surveys, planning and design related to new shinkansen lines, urban railways, deep underground systems, continuous crossing projects, extension of railroad crossings and other services

Aviation
Services related to airports, including planning, design, analysis, preservation, planning of disaster risk reduction and management, development planning for surrounding areas and construction management (airport embankments and offshore runways)

Asset management
Support for individual and integrated asset management, planning of life extension repairs, inspections, management level, cost analysis, best practice, project evaluation, asset evaluation, risk management, various project plans, database management systems and other elements related to social infrastructure (road pavement, bridges, rivers, dams, water supply and sewage, airports, ports, construction, railroads and other facilities)

03 Urban Planning

Development projects
PM and coordination of urban development projects, general development of residential, industrial, and logistics complexes and other facilities, land readjustment projects, feasibility surveys, plotting, planning, design and development licensing and supervision of urban development projects, planning, design and supervision of station squares, bus terminals and other facilities and services

Urban and regional planning
National land and regional planning, comprehensive municipal planning, urban master plans, legal urban planning, urban development regulations, comprehensive regional revitalization strategies, location normalization plan, low-carbon urban planning, redevelopment planning, station surroundings development planning, revitalization of central urban areas planning, district planning, disaster-proof urban planning, basic environmental planning, basic green area planning, PI/consensus building planning, sports, health (sports, health, medical and welfare), wellness, universal design and accessible facilities and others

Transport policy and planning
Transportation policy (transportation facilities, roads and others) and general transportation systems, urban transportation planning, transportation planning (aviation, railroads, LRT, BRT, bicycles, ultra-small mobility vehicles and others), district transportation planning, evacuation planning, TDM, mobility management, ITS, automobile and bicycle parking lot planning, policy evaluation, economy evaluation and economic effect analysis with emphasis on the transportation field, survey and analysis of traffic conditions, traffic estimation and traffic microsimulation and other services

04 Environment and Energy

Environmental policy, biodiversity and environmental assessment
Environmental policies for municipalities, biodiversity conservation, nature restoration, evaluation of environmental impact, simulation of impact on atmosphere, weather and other elements, living environment surveys, natural environment surveys, forest resource management, environmentally conscious design, support for corporate CSR and environmental management, environmental education and other services that we provide as support for the overall environmental field towards building a sustainable society

Environmental energy
Research on energy systems, support for formulation of energy policies and measures against global warming, support for introduction of renewable/unutilized energy, energy conservation systems and others, energy management associated with low-carbon urban development, ESCO advising, business and technology evaluation based on LCA, energy system engineering and other services

Global environment
Measures against global warming, including mitigation (GHG reduction measures) and adaptation (impact evaluation/adaptation measures) and creation of a low-carbon society (CDM/JI and measures against global warming with co-benefits for developing countries, domestic measures) and other services

Resources and the environment (waste)
Formulation of basic plans for general waste disposal, planning, design and supervision of construction of waste treatment facilities (including heat recovery facilities, final disposal sites and recycling facilities), industrial waste treatment facilities and human waste treatment facilities, planning and design of biomass utilization facilities, advisory and monitoring of waste processing and disposal projects (such as PFI and PPP), studying measures for disposing of huge disaster waste, support for private and overseas waste projects and other services

05 Architecture

Construction (plan, design, structures and facilities)
Participation in complex construction and urban projects, construction-related master plans, basic concepts, general master plans, general private and large-scale construction such as government buildings, civic community centers and sports facilities, participation in PFI/PPP projects such as planning, design and commercialization of station buildings and other infrastructures, urban redevelopment coordination, building CM, property management, building asset management, construction technology consultation and other services

06 Geotechnical Engineering

Ground-related technologies (geology, soil quality and water circulation)
Ground surveys, testing, field measurements, geological surveys and analysis, surveys and design for reduction and management of ground disaster risk, measures against liquefaction and ground subsidence, ground structure design, surveys, analysis and slope stabilization design related to measures against landslide disasters, surveys and analysis of hydrological environment, water circulation analysis, preparation of water circulation plans, surveys, analysis and measures against soil and groundwater contamination and other services

07 Facility Engineering

Electrical, mechanical and building facilities
Life extension planning for facilities for reducing and managing tunnel disasters, ventilation and smoke exhaust facilities (roads and railroads), electric and mechanical facilities (including station buildings and buildings), tsunami protection systems, water management and water treatment facilities, eco-friendly energy systems such as solar power generators, road and river management information systems, floodgates, dams and other facilities; design of facilities related to the Olympic Games and other services

08 Business Development

Business development
Projects related to smart communities, wellness, regional energy management (power generation and PPS projects), infrastructure management, regional value creation and others

09 Public Management

PFI/PPP management
Examination of commercialization of PFI/PPP and private projects related to public land usage (including creation of business schemes, financial simulation, identification and organization of legal conditions and risk analysis); support for public offering for businesses (including determination and organization of conditions for application, preparation of examination criteria and required level determination), support for conclusion of project contracts (including support for examination of proposals and support for conclusion of contracts), support for project execution (including facility maintenance and operation monitoring) and other services

Administrative and social management
Support for administrative management reform, public asset management strategy, comprehensive planning, regional management strategy and marketing, administrative management system (including administrative evaluation system, budget system and personnel evaluation system), administrative improvement of public enterprises, management of new public and revitalization businesses, PPP construction, business operation improvement and BPR, action improvement and others

10 Information System

Management system
Maintenance and management of social infrastructure, asset management systems, provision of IT solutions for administrative and private sectors, information communication networks, public information systems, CALS/EC, planning, proposing and construction of electronic application and other systems, development of ASP projects, development and management of outsourcing and other services

Natural and social environment systems
Collection and analysis of information related to natural and social environment, such as disaster risk reduction and management, forestry, climate change, preservation of biodiversity and renewable energy, data processing and analysis using GIS and satellite remote sensing, proposal of measures for regional revitalization (including ones on agriculture, forestry and public transportation) using ICT; creation of regional support businesses, operation management works and other services

ITS and traffic control system
Formulation of various measures centered on information infrastructure for realizing smooth, safe, comfortable road traffic, examination, construction and operation management of systems, such as ITS and traffic control systems, for implementing those measures and other services

11 Overseas

Establishment of factories and formation of industrial complexes based on engineering associated with infrastructure, route development for municipal railroads, construction of smart communities and the development of distribution facilities including ports, harbors, railroads and airports, as well as PFI projects using private-sector funds related to energy development, disaster risk reduction and management, water businesses, waste processing in major cities and global warming countermeasures

12 Research and Development

Contracted research, experiments, tests and environmental analysis
Implementation and contracted implementation of research and development related to infrastructure lifecycle, disaster risk reduction and management, environment and energy, safety and security, computerization and others, hydraulic model experiments on rivers, ports, water supply and sewage and other water, development of observation and measurement technologies for floods, landslides and other disasters, product testing for soil and construction materials, water quality analysis, soil contamination analysis and other services

Supervision:Institute of Technology,
Publication:Corporate Communications Section