Civil Engineering & Eco-Technology Group

株式会社 建設環境研究所
Civil Engineering & Eco-Technology Consultants Co., Ltd.

[Head Office (Contact)] +81 3 3988 2643
matsuda@kensetsukankyo.co.jp

2-23-2 Higashi Ikebukuro, Toshima-ku, Tokyo 170-0013, Japan
Representatives:
Mr. Wakamatsu, Mr. Matsuda,and Mr. Kobayashi
Branches:
Sapporo, Tohoku, Tokyo, Center for Environmental Science and Technology (Omiya), Niigata, Chubu, Osaka, Takamatsu, Kyushu, Okinawa, 25 Sales Offices and 2 Offices

[Center for Environmental Science and Technology]

1-268-1 Kushihiki-cho, Omiya-ku, Saitama 330-0851, Japan
Activities:
Air, soil, water, and sediment quality, noise, vibration, waste, biological, odor, pesticide, asbestos, dioxin, and environmental measurements.

[ISO Certification]

ISO9001

[KES Certification]

KES Step 1
Holder: Head Office (Tokyo)
Center for Environmental Science and Technology(Saitama)

三洋テクノマリン 株式会社
Sanyo Techno Marine Inc.

[Head Office (Contact)] +81 3 3666 3149
yoshitani@stm.co.jp

1-3-17 Nihonbashi Horidome-cho, Chuo-ku, Tokyo 103-0012, Japan
Representatives:
Mr. Okabe, Mr. Niwa, Mr. Yoshitani and Mr. Mizugai
Branches:
Sapporo, Tohoku, Fukushima, Kasukabe Center for Technology, Omiya Center for Environmental Analysis (within the Center for Environmental Science and Technology), Nagoya, Osaka, Kyushu, and 13 Sales Offices

[Ecology Laboratory]

1-3-17 Nihonbashi Horidome-cho, Chuo-ku, Tokyo 103-0012, Japan
Activities:
Plankton, benthos, benthic alga, seaweed, fish, bird, insect, egg, plant and environmental factors identification.

[Waterfront Development Group]

1-3-17 Nihonbashi Horidome-cho, Chuo-ku, Tokyo 103-0012, Japan
Activities:
Regional revitalization and urban planning, related budget and documentation, etc.

[ISO Certification]

ISO9001

[KES Certification]

KES Step 1
Holder: Head Office (Tokyo)

Major membership group

Japan Wind Power Association
The Japan Civil engineering Consultants Association
Japan Association of Environment Assessment
The Ports & Harbors Association of Japan
Japan Environmental Measurement and Chemical Analysis Association
Japan Marine Surveys Association
Japan Hydrographic Association
Japan Association of Surveyors
Service Center of Port Engineering
Japan Agency for Marine-Earth Science and Technology
Fisheries Infrastructure Development Center
National Association of Sea Coast
The Association for Environmental Conservation of the Seto Inland Sea
Cold Region Port and Harbor Engineering Research Center
Research Institute for Seto Inland Sea
The Japanese Society of Fisheries Oceanography
The Oceanographic Society of Japan
Japanese Society of Fisheries Engineering
Japan Geothermal Association
Japan Society of Civil Engineers
Parks &Open Space Association of Japan
Japan River Association
Japan Society of Erosion Control Engineering
Japan Road Association
Japan Society for Atmospheric Environment
Consultants of Landscape Architecture In Japan
Japan Society on Water Environment
Planning Consultants Association of Japan
Ecology and Civil Engineering Society
Association of Port Engineering Consultants

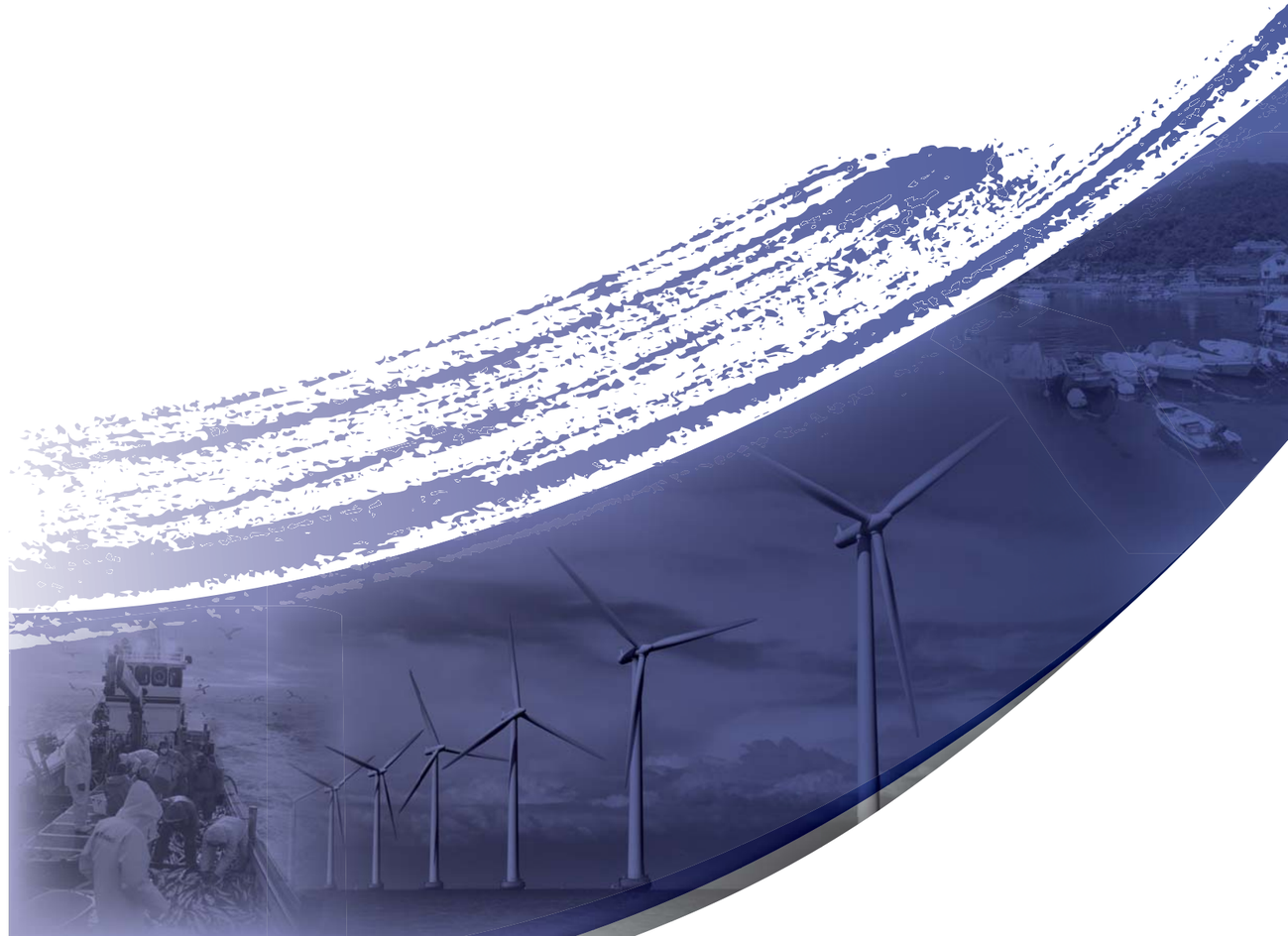
(Created in February 2018)

Civil Engineering & Eco-Technology Group

建設環境研究所
Civil Engineering & Eco-Technology Consultants Co., Ltd.

三洋テクノマリン
Sanyo Techno Marine Inc.

From feasibility studies to rapid environmental assessments, we provide 'one-stop' solutions for the offshore wind power industry



Rapid Environmental Assessment

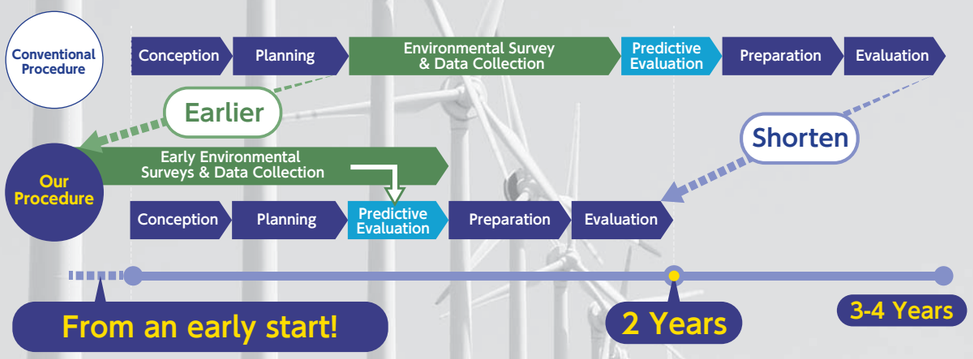
Using the experience in several land-based wind farm assessments, the Civil Engineering & Eco-Technology Consultants produced the “Rapid Environmental Assessment Guide” during the commissioned NEDO project.
We are currently working in a demonstration project to reduce in half the time required for a conventional assessment.
※(Results available at NEDO homepage)

“Rapid Environmental Assessment”
3 *points*

Point.1
Reduce the assessment time with early environmental surveys

Point.2
Avoid resurveys through early data gathering and hearings with academic experts

Point.3
Enhance communication with local residents and fishermen to smooth the consensus process



The 3 values of the Civil Engineering & Eco-Technology Group

Nearly 60 years of achievements

Since its foundation in 1959, Sanyo Techno Marine has specialized in environmental measurements and marine surveys, offering consulting services for the construction of facilities and preliminary studies for the selection of sites, among others.
In addition, with the mutual trust developed from a long and well-nourished relationship with fisheries cooperatives around Japan, we are capable of handling local negotiations smoothly.

●Fisheries cooperatives in Japan with good relation to us

Regional Contribution

We are able to demonstrate the benefits that a power plant can bring to a region, so that offshore wind farms can take advantage of the region’ s unique environment. Wind farms can not only be widely accepted by local residents but also prosper.
Likewise, we adeptly facilitate the creation and preservation of thriving relationships with local stakeholders through regional promotion activities.

With the extensive experience in law assessment of Civil Engineering & Eco-Technology Consultants combined with the more than fifty years of involvement in marine consulting of Sanyo Techno Marine, we can provide comprehensive support services for the offshore wind power industry.

Business flow

Potential maps obtained from upper-level plans of public administrations

Extraction of promising areas

Offshore wind farm conception
(rough design based on existing information)
・Generated power (total output)
・Number of turbines
・Turbines layout

Itemization of environmental components, legal framework, economic efficiency, stakeholders, etc

Zoning (Wind turbine zone, fisheries zone, natural conservation zone, etc.)

Feasibility Study (FS)

Field surveys for the installation of submarine cables and turbines layout
・Seafloor topography ・Seafloor surface layer thickness
・Benthic habitats ・Marine current conditions
・Bathymetr ・Wind speed and conditions

Site Conditions Survey
・Seafloor mapping ・Fisheries structures
・Seafloor obstacles ・Existing cables
・Scouring and erosion

Basic Design

Final Design

Construction Process

Start Operation

Project Conception

Project Planning

Con-struction

Desk Work for Project Conception

Preliminary examinations and selection of promising areas.

Use of our expertise and know-how on the requirements for the installation and route planning of submarine cables and submarine pipelines to provide support during the desk work phase for the identification of promising areas.

Feasibility Study (FS)

Complete support from legal approval and permits to itemization.

Using seafloor topographical and geological surveys, we analyze and organize the information to provide fundamental advice for wind farm designs and turbine layout. We provide support from the itemization of the components of the environmental impact assessment to the application for the legal approval and selection of suitable site.

Site Conditions Survey

Investigate the site conditions with prospecting and field surveys.

Seafloor mapping and marine currents surveys to evaluate the site conditions and assess construction techniques.
Select suitable cable routes using simulations to detect areas likely affected by longshore drift, based on the results of the environmental measurements and field surveys.
・Seafloor mapping survey→ p.6
・Numerical model (FVCOM) → p.6
・Acoustic doppler with modem → p.6

Supported elements

Environmental Assessment

Consideration procedure

Methodology proceedings
Predictive evaluation
Preparatory proceedings
Evaluation proceedings

Early Environmental Surveys
・Atmospheric
・Environmental
・Marine
・Others

Field survey

Post Implementation
Construction Monitoring
Monitoring Surveys

Evaluation of Regional Contribution Measures
・Increase of marine resources
・Fisheries support
・Tourism
・Others

Environmental Assessment

Reduce in half the assessment process period with early environmental surveys

We provide advice on early start using the achievements obtained during the “Early environmental assessment database project” commissioned by NEDO (New Energy and Industrial Technology Development Organization).

Smooth assessment process attained with our extensive experience

We can swiftly procure the appropriate applications and procedures thanks to the experience obtained in several consideration procedure and environmental assessment projects.
・Rapid environmental assessment → p.2

Regional Contribution Measures

Support of fisheries cooperatives included in the wind farm proposal

Measures to mitigate the reduction of artificial reef and fishing areas, including environmental improvement and the design of artificial structures. Support from planning to post implementation.
・Quantitative echosounder → p.7
・Biologging, biotelemetry → p.7
・Satellite image analysis → p.8
・Artificial reefs and habitat creation → p.8

Consensus

Towards reaching a consensus with local stakeholders

Thanks to the good relationships we have achieved through a long exchange with several fisheries cooperatives, we can smooth the consensus process. We are capable of setting up meetings, propose regional contribution measures, etc.
In addition, we can implement regional promotion activities, such as study meetings or local workshops.
・Fisheries cooperatives relationship → p.3

Smooth process for business success

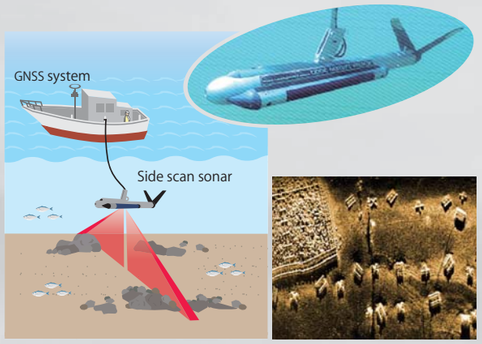
With the legal expertise of Civil Engineering & Eco-Technology Consultants and the marine knowledge of Sanyo Techno Marine, we provide consolidated support

Technology

01 Seafloor mapping surveys

The latest technology for a full support of the site selection and construction techniques.

Using the latest equipment, like multibeam echosounders, side scan sonars and sub-bottom profilers, we can map the seafloor topography and sediments.
Our experienced technicians can fully support site selection and construction techniques studies.

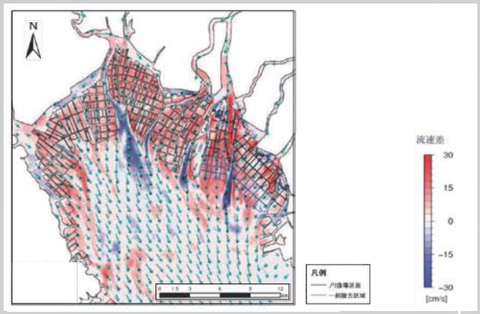


Seafloor image from a side scan sonar survey

02 Predictive simulation of environmental conditions with a numerical model

Solve challenges like sediment stabilization or environmental impact assessments!

Evaluation of the impact that high waves and strong currents have on the seafloor (scour, erosion, etc.), as well as the influence on marine organisms in the areas surrounding the wind farm.
To predict and analyze these in advance, we use a numerical model for the environmental physical conditions, like tides, currents, waves or water quality, being able to also evaluate mitigation measures.

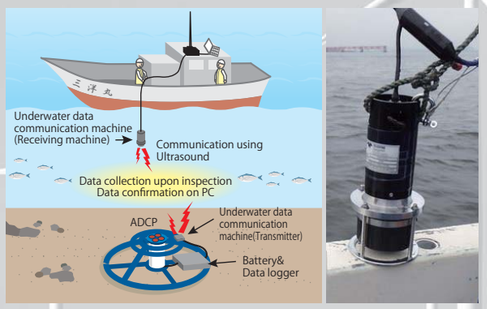


Effect of the installation of seaweed nets on marine currents
(Presented at the Japanese Society of Fisheries Science, 2016)

03 Measurement of current speed and direction with an acoustic doppler with underwater modem feature

Improved data collection and safety!
Reduced cost of marine current measurements.

During a conventional marine current measurement survey, is necessary to retrieve the equipment to recover the data and check the instrument with divers, which carries a number of risks and costs.
Thanks to the underwater acoustic modem feature, we can complete these tasks from a boat, increasing the efficiency and rate of data retrieval and reducing costs.



ADCP data retrieval using underwater acoustic modem

04 Acoustic monitoring of cetaceans

Top class in the country for the number of devices in property and projects commissioned by the Ministry of Environment.

Using an acoustic device (A-Tag, MMT Co., Ltd), we can identify the species emitting the unique languages recorded, as well as estimate the number of individuals and their trajectories.
As there are many unknown impacts of underwater noise in marine organisms, continuous monitoring can be carried out in wind farms located in waters frequented by cetaceans.

Survey of occurrences of finless porpoise

Acoustic monitoring device

05 Fish abundance and distribution surveys using quantitative echo sounders

New technologies to quantitively evaluate fish distribution and assemblage

Quantitative echo sounder surveys are an advanced method to detect marine life, from fish to seagrass and plankton, and capable of measuring size, abundance and densities in large areas.
We can quantitatively assess the distribution of seagrass and seaweed beds before and after the installation of a wind farm, and the assemblage of fish in underwater structures like wind turbines, among others.

Survey of fish on a seaweed area with the quantitative echo sounder

06 Understanding fish behavior with bio logging and biotelemetry

Fish behavior assessment and extensive data analysis support for bio logging and biotelemetry studies.

Bio logging and biotelemetry techniques are based on the attachment of small electronic devices to the body of marine organisms that collect data of the environment surrounding the animal, like water depth or temperature, which can be used for fisheries management and resource improvement.
We provide full support throughout the process, from survey plan and design to data analysis and results interpretation.

Fish equipped with a data logger for a behavioral ecology survey

12 smart solutions to solve business challenges

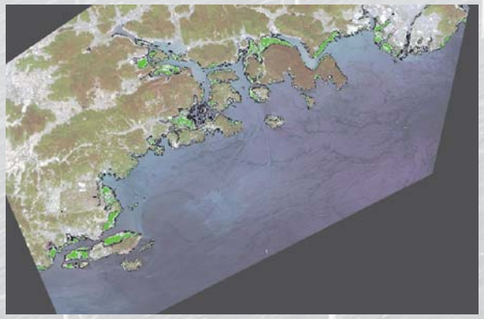
For environmental assessments, is necessary to evaluate the solutions to challenges.
Look at some of the technological skills of our group in different assessment projects

Technology

07 Mapping of shallows in large areas with satellite image analysis

With satellite image analysis techniques, we can understand the environmental conditions in large areas.

Satellite image analysis is a very effective methodology to map different marine environmental conditions in large areas. The analysis of the image is made based on survey data, and currently we can accurately map the distribution of seagrass and seaweed beds and phytoplankton concentration, and we are presently working as well in mapping the distribution of surface turbidity and water temperature, among others.

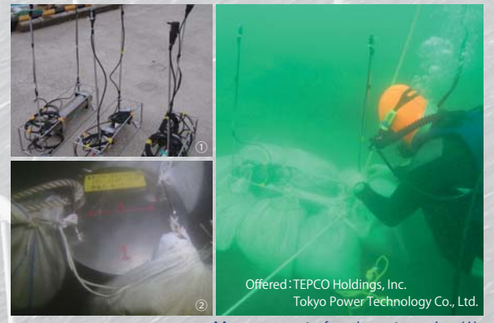


Distribution map of seagrass/seaweed beds

08 Underwater noise and seafloor vibration

Improving the monitoring of marine organisms during the installation and operation of wind turbines.

A multitude of marine organisms, like cetaceans or fishes, inhabit open water areas. To predict the impact that the underwater noise and seafloor vibration that accompanies the construction works for the installation of wind farms and the daily operation of turbines can have in the marine life, we can evaluate the emitted levels, improving the environmental monitoring.

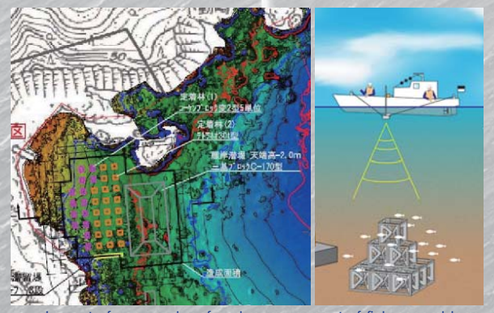


Measurement of underwater noise (1) and seafloor vibration (2) in Chosi

09 Creation of fishing grounds with seagrass/seaweed areas and artificial reefs

Increasing fisheries resources to enhance cooperation between offshore wind farms and fisheries cooperatives

The concept of cooperation between fisheries cooperatives and offshore wind farms is build on the promotion of offshore wind farms alongside the revitalization of the region, to achieve benefits for both the wind farm operator and the fisheries cooperatives.
The installation and operation of wind farms can cause disruptions in ship navigation that affect fisheries operations, becoming necessary to promote wind farms among fisheries cooperatives and local communities to create acceptance. We can support projects to install artificial reefs or conceive seagrass/seaweed areas, from the selection of the location and target species to the monitoring of their efficacy.



Layout of seaweed reef and measurement of fish assemblage

10 Proper noise prediction

Noise prediction based on weather conditions, terrain and land use situation

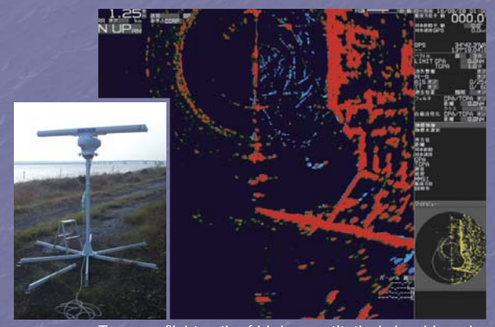
We will evaluate the influence on neighboring houses, predicting noise environment based on weather conditions, terrain and land use situation on coastal offshore wind farms. It is easy for residents and fishermen to understand the prediction results by using the terrain three dimensional models.

Noise contour for visualization

11 Measures against bird strike

Realize proper assessment without rework, investigating the behavior of birds by the latest method

An accident where a bird collides with a windmill is one of the most important tasks in the assessment for offshore wind farm. We realize proper assessment, by combining the visual inspection and ship radar where we can evaluate more accurately that some species fly when, where and how high.



To grasp flight path of birds quantitatively by ship radar

12 Land scape simulations by VR

Real prediction for scenery with windmill in 3-D model

Indicating the windmill on 3-D terrain model, we can predict really the change of land scape. It is possible to set the viewpoint arbitrarily in 3-D VR, and it becomes easy for residents and fishermen to gain understanding. Where in normal case, land scape photos from some view point are used only for prediction.

Real prediction for change of land scape by setting the view point freely

12 smart solutions to solve business challenges

Wind power model coexisting with local people

Renewable energy such as wind power and geothermal power is a power generation resource that can be used for a long period of time utilizing the natural environment peculiar to the area.
Understanding the local people such as local residents, local governments, and agriculture, forestry and fisheries industries is essential when constructing these power plants. Therefore, it is the key to clearly show what kind of benefits the power plant will bring to the local. In addition, it is also necessary to maintain good relationships so that smooth negotiations can be made during equipment renewal. For these reasons, proposals for regional promotion measures for renewable energy power generation projects are becoming increasingly important.

Particularly in offshore wind power generation, cooperation with fisheries including fishing and harbor functions is indispensable. Civil Engineering & Eco-technology Consultants co. has numerous achievements in the area of revitalization of depopulated areas in dam projects including hydroelectric power generation. In addition, Sanyo Techno Marine has know-how that we have cultivated up to now, such as communication with fishermen created through marine consulting work for 60 years, utilization of fishery resources, improvement of port functions and maintenance technology. Based on these achievements, we propose regional contribution plans where wind power generation business is easy to accept, and support construction of relationship with local.

Group companies

Abundant regional activation performances
建設環境研究所
Civil Engineering & Eco-Technology Consultants Co., Ltd.

Building relationship with fishery cooperatives over half a century
三洋テクノマリン
Sanyo Techno Marine Inc.

Collaboration with the local

Example of community contribution

- Growth of marine resources,
- Monitoring of fishing support,
- Town development on the beach, And etc.



建設環境研究所 Civil Engineering & Eco-Technology Consultants Co., Ltd.

Certified Personnel (up to February 2018)

・Registered Professional Engineers	236 people
Engineering Management	57 people
Civil Engineering	151 people
Water Supply & Sewerage	1 person
Environment	14 people
Applied Science	6 people
Information Engineering	2 people
Environmental Engineering	3 people
Agriculture	2 people
・Registered Civil Engineering Consulting Manager	94 people
・PhD (Engineering/Agriculture/ Science/Fisheries Science)	41 people
・Special upper grade engineer	1 person
・1st grade civil engineer	18 people
・First-class architect	3 people
・Landscape Engineer Manager Class-1	25 people
・Civil Engineer Manager Class-1	9 people
・Surveyor	24 people
・River maintenance engineer	14 people
・River checker	69 people
・1st kind Dam water channel chief engineer	2 people
・Concrete diagnostician	2 people
・Landslide prevention engineer	2 people
・Geological survey engineer	4 people
・Registered Environment Measuring Engineer	18 people
・Registered Weather Forecaster	5 people
・Pollution Control Administrator	16 people
・Soil Contamination Surveys Technical Manager	5 people
・Registered Environmental Counselor	15 people
・Environmental Assessor	23 people
・Biotope Planners and Builders	67 people
・Registered Taxonomic Proficiency	31 people
・Tree Doctors	1 person
・Certified city planner	2 people
・Japan Fisheries Research and Education Agency:Fellow	1 person
・Certified Harbor Survey Engineer	1 person
・Data processing Engineer	10 people

Company Licenses and Patents

Registration qualification

・Construction consultant registration; Building 29 No. 3460(December 13, 2012)
River, Coast and Ocean
Port and Airport
Road Division
Landscaping department
Urban Planning and Regional Planning Division
Soil and basic sector
Environmental
Geological division
・Geological Surveyor Registration; Quality No. 27 No. 1547
・Surveyor registration; (7) 14861
・First class architect office registration; (Tokyo) No. 37113
・Measurement certification business registration; (concentration) No. 573
・Measurement certification business registration; (sound pressure level) No.15
・Measurement certification business registration; (vibration acceleration level) No. 17
・Designated Investigation Organization based on Soil Contamination Countermeasures Act; 2003-3-1127
・Work environment measurement institution registration; (Saitama) 11-47
・ISO certification; ISO 9001 [ASR-Q 3589]

Patent

【Patent number】
・Deposit flow distribution and purification method in sewage pipe:No.1898704
・Supporting device of telescopic device in bridge:No. 3907021
・River flow rate observation system:No. 4520878
・Flow measurement device:No. 4539842
・River electromagnetic flow velocity sensor, river flow velocity measurement device, river flow velocity measurement system:No. 4902263
・Water flow measurement system and water flow measurement method:No. 5047886
・Noise level meter and program for noise measurement:No. 5235120
・Method for measuring perspective distortion:No. 5594697
・Sluice gate / sluice pipe inspection support system and sluice gate / sluice pipe inspection support method:No. 5925230
・Noise meter and program for noise measurement:No. 6025148

三洋テクノマリン Sanyo Techno Marine Inc.

Certified Personnel (up to February 2018)

・Registered Professional Engineers	70 people
Engineering Management	16 people
Civil Engineering	39 people
Environmental	4 people
Applied Sciences	2 people
Fisheries	9 people
・Registered Civil Engineering Consulting Manager	26 people
・PhD (Engineering/Agriculture/ Science/Fisheries Science)	11 people
・Civil Engineer Manager Class-1	2 people
・Landscape Engineer Manager Class-1	1 person
・Surveyor	15 people
・Ocean & Port Surveyor	44 people
Environmental Surveyor	25 people
Weather & Oceanographic Surveyor	9 people
Soil & Geological Surveyor	1 person
Shallows Surveyor	8 people
Hazardous Materials Surveyor	1 person
・Hydrographic Survey Engineer	14 people
Coastal (First Grade)	4 people
Port (First Grade)	3 people
Coastal (Second Grade)	7 people
・Fisheries Engineer	4 people
・Ocean & Port Infra Maintenance Manager	2 people
・Ocean & Port Infra Designer	1 person
・Environmental Measurement Surveyor	4 people
・Pollution Control Administrator	5 people
・Registered Environmental Counselor	3 people
・Environmental Assessor	5 people
・Biotope Planners and Builders	7 people
・Registered Taxonomic Proficiency	13 people
・Japan Fisheries Research and Education Agency:Fellow	1 person
・Data processing Engineer	2 people

*Unofficial translation of the names of the original Japanese certifications

Company Licenses and Patents

Company Licenses

・Construction consultant license: No. (25) 3033
River, Coast and Ocean
Port and Airport
Environmental
Fisheries Engineering
・Surveying license: No. (14) 245
・Measurement licenses: No. 601 (Concentration), No. 43 (Sound Pressure Level), No. 32 (Vibration Level) from Saitama Prefectural Governmental Registration

Patent

【Patent number】
・Utility Model Registration Number 3039192
Seaweed reef created with seaweed transplanted in a block
・Utility Model Registration Number 3091776
Floating weather measuring device with positioning and communication features
・Pending Patent, Application No. 2010-172011
Port infra measuring device
(Co-filed application with Ataka Co. Ltd.)

*Unofficial translation of the names of the original Japanese licenses and patents

To be a business that continues to contribute to the region

To establish a wind farm is indispensable to understand the region.
We create proposals that contribute to local revitalization.