Creation of a Sustainable and Rich Global Environment

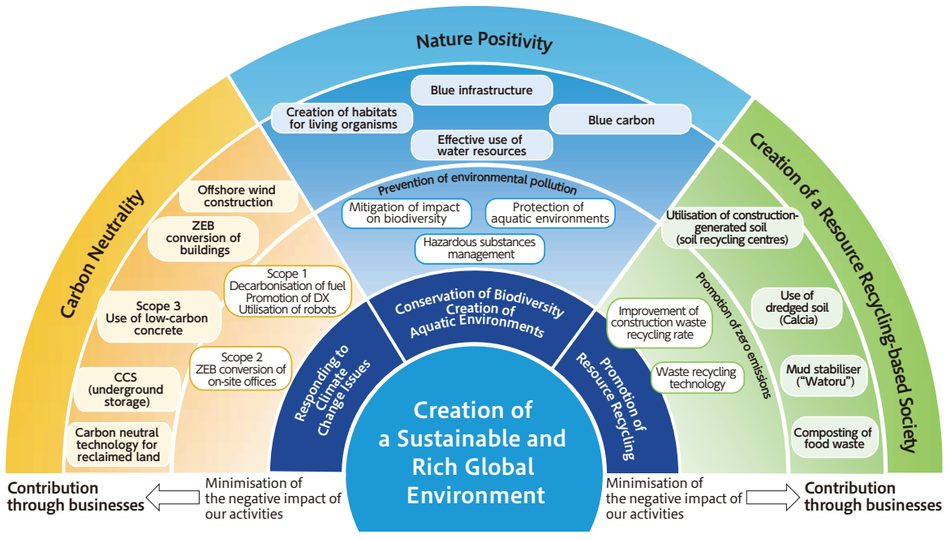
Materiality Responding to Climate Change Issues, Creation of a Rich Environment

The Penta-Ocean Construction Group strongly believes that passing on a nature-rich environment for future generations is fundamental to our business activities. Guided by this belief, we engage in manufacturing with consideration for the global environment.
For each of the issues identified as Materiality (key issues), namely "Responding to Climate Change Issues" and "Creation of a Rich Environment," we engage in initiatives aimed at contributing to society through our business and minimising the environmental impact of the Group's activities.

Initiatives of the Penta-Ocean Construction Group

- **Responding to Climate Change Issues**
  We are working to reduce CO_2 emissions from our construction business activities, while advancing businesses such as offshore wind construction, ZEB conversion of buildings, and the use of low-carbon concrete, aiming to achieve carbon neutrality.
- **Biodiversity Conservation and Creation of Aquatic Environments**
  As nature-positive initiatives, we promote biodiversity conservation, creation of aquatic environments, prevention of environmental pollution, and effective use of water resources.
  We are developing technologies to reduce the environmental footprint associated with construction and mitigate effects on marine organisms. These efforts include expanding the application of blue carbon, developing blue infrastructure technologies, and creating habitats for living organisms, as part of our efforts toward commercialisation.
- **Promotion of Resource Recycling**
  We are enhancing the recycling rate of construction waste from our activities and advancing contaminated soil treatment business and recycling businesses for materials including construction-generated soil, construction sludge, dredged soil, paper ash, and food residues, thereby contributing to the creation of a resource recycling-based society.

web Creation of a Sustainable and Rich Global Environment



Principle of Environmental Activity

1. In addition to reducing CO_2 emissions generated in construction business activities, promote ZEB for project offices, thereby contributing to the realisation of carbon neutrality.
2. Strive to create a recycling-based society and create, preserve, and restore the environment through communication with local communities, the development of environment-related technologies, and environmentally friendly design and construction.
3. Continuously educate the staff of the Company and business partners on the importance of environmental conservation activities, and strive to prevent environmental accidents (air, water, and soil pollution) and ensure thorough waste recycling, as well as compliance with environmental laws and regulations.

web Safety, Health, Quality, and Environmental Policy

Environmental Conservation in Business Activities

The Penta-Ocean Construction Group operates an environmental management system that complies with ISO 14001 standards across all business activities (construction production activities and office activities), and promotes construction practices that take into account environmental protection.

Promotion System

・Quality and Environment Management Committee
The environmental management system is overseen by the Quality and Environment Management Committees of the Headquarters and each branch office, established under the Sustainability Promotion Committee chaired by the President, CEO and Representative Director. The system is applied to our business activities. We formulated the "Integrated Manual" that outlines the rules and procedures for corporate management in conformity with the certified environmental management system, and implement it across the organisation.
In addition, we continuously provide training sessions to employees, including management system training for young employees, to inform and educate our employees.



Environmental Management System

Our environmental management system conforms to ISO 14001 standards. We obtained ISO 14001 certification as a company-wide environmental management system in November 2002, and have been operating it as a means to promote continuous system improvement and efficient, effective operations.

web List of ISO Certifications, etc.

Environmental Patrols

We conduct environmental patrols at each branch's construction sites to prevent the seven typical types of pollution (air pollution, water contamination, soil contamination, noise, vibration, ground subsidence, and foul odours) and other forms of environmental pollution, to achieve zero legal violations related to the environment, and to prevent incidents that could lead to environmental complaints to the extent possible.

Compliance with Environmental Laws and Regulations

In order to conduct business activities with due consideration for the environment in all aspects, such as preventing global warming and ensuring proper waste disposal, we regularly monitor compliance with environmental laws and regulations. We respond promptly to any revisions of these laws and regulations and strive to prevent legal violations related to the environment. There were zero major legal violations related to the environment in FY 3/26.

Education and Awareness

・General and Specialised Environmental Training
We provide general environmental training for all executives and employees and specialised environmental training to keep all employees apprised of the necessary knowledge of overall environmental management at construction sites and the key points of legal revisions. Specialised environmental training is held annually at each headquarters and branch office, in which applicable employees participate regularly (once every three years). The number of participants in specialised environment training in FY 3/26 was 527.

・Environmental Study Session Before Construction Commencement
To confirm and enhance the environmental knowledge of site staff, the Safety, Quality and Environment Management Division conducts environmental study sessions prior to the start of construction. Through this training, we ensure thorough implementation of measures to prevent environmental contamination, etc. and to maintain compliance with laws and regulations. In FY 3/26, sessions were held at 134 sites.

web Environmental Management

Zero-Emission Promotion Activities at Construction Sites

At construction sites, we have been promoting zero-emission activities company-wide since FY 3/07 to reduce final disposal volumes, and are implementing 3R (Reduce, Reuse, Recycle) promotion activities with full participation, based on the principle of suppressing waste generation.

web Zero-Emission Promotion Activities at Construction Sites

Prevention of Environmental Pollution and Resolution of Environmental Issues

In the construction business, we face various environmental issues, including soil contamination caused by heavy metals and chemical substances, dioxin issues at incineration facilities, and water pollution. To resolve these issues, we actively implement countermeasures and engage in development of related technologies.

web Prevention of Environmental Pollution


Implementation of Insolubilisation Methods for Heavy Metals, etc.

Responding to Climate Change

Materiality
Responding to Climate Change Issues

Information Disclosure Based on TCFD Recommendations

We believe that responding to climate change issues is one of our most important management issues, and are strengthening our efforts to reduce greenhouse gas emissions both domestically and internationally. In addition to undertaking initiatives to reduce CO_2 emissions from our construction business activities, we will strive to achieve carbon neutrality by 2050 through our core business by promoting the construction of offshore wind power facilities and the conversion of buildings into ZEB (Net Zero Energy Buildings).

web Information Disclosure Based on TCFD Recommendations

1. Governance

The Carbon Neutral Promotion Committee chaired by the President, CEO and Representative Director and the CN Promotion Office play a central role for the further advancement of initiatives for reducing GHG emissions. As a subordinate organisation under the Sustainability Promotion Committee (Chairperson: President, CEO and Representative Director), this committee is responsible for deliberating important matters such as the basic policy for responding to climate change issues for our Group, planning and formulating strategies, and measures based on the results of monitoring the status of initiatives. The Committee decisions are reported to and discussed at the Sustainability Promotion Committee. The Committee decisions on policies and strategies are incorporated into business plans of each business unit, the company-wide annual plans and Medium-term Management Plan, and they then progress towards their implementation. The Board of Directors receives reports from the Sustainability Promotion Committee and oversees all sustainability related issues including climate change issues. The implementation of measures to address climate change issues will be continuously monitored by the Carbon Neutral Promotion Committee in order to review and improve our policies and strategies.

2. Strategies

In the construction industry, CO_2 emissions from construction activities are relatively small compared to other industries. However, the marine civil engineering work, which is one of our fortes, is characterised by higher CO_2 emissions than other construction work and civil engineering work performed on land, because of the use of work vessels. As part of our initiatives to tackle the issue, we have identified the risks and opportunities that climate change may pose to our Group, and performed scenario analyses. As a result of the analyses, we expect to see an increase in capital investment in maintenance, renewal, and new construction of work vessels to achieve their carbon neutrality. We believe, however, that we will witness more business opportunities for the Company that outweigh these drawbacks. These opportunities include the promotion of offshore wind construction in the civil engineering field, and the promotion of ZEB technology application in the building construction field. As a company with distinctive strengths in marine civil engineering technology and as a front-runner in offshore wind construction, we will contribute to the expansion of renewable energy supply in Japan as well as to the development of a sustainable society.

3. Risk Management

The Risk Management Committee, established under the Sustainability Promotion Committee, plays a central role in systematically classifying risks assumed in business activities, assigning a department in charge for each risk, and implementing appropriate risk management. The CN Promotion Office is the department in charge of climate change risks. They identify and evaluate risks and implement countermeasures against these risks from a long-term perspective. The results of deliberations by the Carbon Neutral Promotion Committee are reported to and discussed at the Sustainability Promotion Committee. The activity status of the Sustainability Promotion Committee is reported to the Board of Directors, which oversees the implementation of risk management for climate change. In the event of the occurrence of climate change risk, it is promptly reported to the supervising department, determined according to the degree of impact on corporate management (major risks are reported to the Board of Directors). As described above, we have a system in place to respond to risks in a timely and appropriate manner.

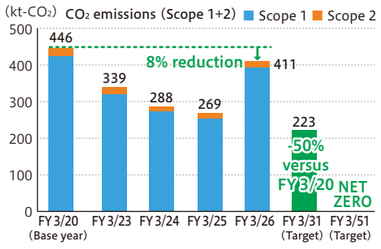
Risks, Opportunities, and Countermeasures

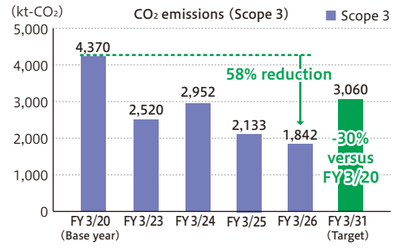
Categories		Climate change	Impact on businesses	Countermeasures
Transition risks and opportunities	Risks	Policy changes and regulation tightening on CO_2 emission reduction	・Increase of climate change response costs for construction and other business activities (in particular, costs to reduce CO_2 emissions from construction machinery and work vessels) ・Increase of procurement costs for construction materials (cement and steel), which have high CO_2 emissions during manufacturing process ・Further increase in climate change response costs and construction costs due to the introduction of a carbon tax	・Reduction of CO_2 emissions from construction machinery and work vessels (Scope 1) Improvement of construction efficiency: Electrification, use of ICT, and promotion of automatic and autonomous construction Fuel decarbonisation ⇒ from low-carbon to zero-carbon: (Short-term) Use of additives to improve fuel efficiency (Mid-term) Use of alternative fuels (BDF, GTL) Utilisation of renewable electricity (including electricity supply from land and rechargeable batteries) (Long-term) Introduction of hydrogen, ammonia, and other next-generation energies
			・Increase in costs due to tightening of Energy Efficiency Act and mandatory ZEB application	・Reduction of CO_2 emissions (Scope 2, 3) Promotion of the renewable electricity use at site offices, etc. (Scope 2) Promotion of introduction of CO_2 adsorption materials and low-carbon concrete, etc. (Scope 3) CO_2 fixation by solidification of dredged sediments (Scope 3)
	Opportunities	Increased construction demand related to renewable energy and energy conservation	・Increase in demand for the construction of offshore wind farms ・Increase in demand for the construction of ZEB buildings/ZEB technology application	・Strengthening offshore wind construction initiatives (e.g., capital investment in equipment for offshore installation vessels and other large work vessels) ・Promotion of ZEB proposals, design, and construction of ZEB buildings. Trial use of hydrogen at Company-owned facilities ・Issuance of green bonds for capital investment
Physical risks and opportunities	Risks	More intense and frequent natural disasters	・Extension of construction period and increase in construction costs due to damages by disasters made during construction ・Supply constraints due to disruptions in the supply chain for construction materials and equipment	・Establishment of BCP system and regular implementation of disaster drills (for BCP and tsunami)
		Decrease in construction productivity due to severer weather/conditions caused by rising sea temperature	・Increased risk of process delays and higher construction costs due to lower utilisation rates, especially in marine civil engineering work	・Advanced weather and metocean forecasting systems
		Decrease in construction productivity during summer caused by temperature rise	・Increased risk of workers' heat stroke on construction sites ・Decreased productivity due to increased frequency of break times to prevent heat stroke	・Improving productivity by saving labour on sites (contribution to CO_2 reduction) Actively using precast concrete for concrete work and promoting DX (digital transformation)
	Opportunities	Increase of construction demand related to the national resilience plan	・Increase in construction demand for disaster prevention, disaster mitigation, and national resilience ・Increase in demand for disaster recovery work	・Development and practical application of technologies that contribute to the national resilience plan

Results of Major Countermeasures (FY 3/24–FY 3/26)

Item	FY 3/24	FY 3/25	FY 3/26	Details of implementation
Introduction rate of fuel-efficiency additives, biofuels, etc.	14.2%	18.2%	**33.1%**	In FY 3/26, 4,676 KL of biofuel was used in Indonesia
Introduction rate of environmentally friendly construction machinery	2.2%	2.3%	**2.8%**	Introduction of electric, hybrid, and ICT construction machinery
Number of ZEB and other certifications obtained by site offices	2	0	**2**	Promotion of ZEB conversion of site offices
Amount of renewable energy used	626	865	**1,085**	In-house renewable energy generation + purchased green electricity

4. Metrics and Targets





SCIENCE BASED TARGETS
DRIVING AMBITIOUS CORPORATE CLIMATE ACTION

The FY 3/31 reduction targets have obtained SBTi validation at the 1.5°C level

Roadmap to Achieve Carbon Neutrality (CN) (Scope 1, 2)

<Short-term Initiatives> Low Carbonisation

Fuel efficiency improvement (Scope 1)
- Engine-idle reduction, energy saving education, and ensuring proper maintenance of major vessels and machinery
- Promotion of the on-site use of K-S1 and other **fuel efficiency improvement additives**

Improvement of construction efficiency (Scope 1)
- **Improving construction efficiency through the use of ICT technology** for land-based construction machinery and work vessels, and promoting more efficient energy use in work vessel equipment
- Tracking the market trend of electrified land-based construction machinery—Promoting their on-site use
- Conducting studies for the **electrification of cranes and winches on work vessels** and utilisation of large rechargeable batteries and fuel cells

New energy (Scope 1)
- Tracking technological trends, such as engine development, for the introduction of new energy sources
- Review of contribution to the Carbon Neutral Port (CNP) as an import and storage hub for new energy sources

Energy conservation and energy creation (Scope 2)
- **Promotion of ZEB conversion of site offices, etc.**

FY 3/31 reduction target: -50% (compared to FY 3/20)
FY 3/31

<Mid-term Initiatives> Low Carbonisation to Decarbonisation

Fuel efficiency improvement (Scope 1)
- Study aimed at the introduction of dual fuel engines, etc. (from research and development to on-site implementation)

Improvement of construction efficiency (Scope 1)
- **Exploring automatic and autonomous operations by electrification of work vessels** (from programme development to on-site implementation)

New energy (Scope 1)
- **Utilisation of alternative fuels** such as BDF (biodiesel fuel) and GTL (gas-to-liquid fuel)
- **Onshore power supply** (work vessels)
- Utilisation of by-product hydrogen and ammonia, trial use of green hydrogen

<Long-term Initiatives> Decarbonisation

New energy (Scope 1)
- Introduction of work vessels and land-based construction machinery which run on new energy
- Utilisation of green hydrogen and ammonia
  Utilisation of surplus electricity from offshore wind power generation (onshore power supply and green hydrogen utilisation)

FY 3/51 reduction target -100% (Compared to FY 3/20)
FY 3/51

Advancement of Nature Positive Initiatives

Materiality
Creation of a Rich Environment

The Group formulated the Action Guidelines on Biodiversity in August 2025. We are further strengthening initiatives for biodiversity conservation and the creation of aquatic environments and, toward the realisation of nature positive future, we aim to minimise the negative environmental impact of our business activities and to restore and create nature.

web Action Guidelines on Biodiversity

Information Disclosure Based on TNFD Recommendations

Endorsing the philosophy of the TNFD (Taskforce on Nature-related Financial Disclosures), we began nature-related financial disclosure based on the TNFD recommendations in May 2026.

Taskforce on Nature-related Financial Disclosures

Full text: web Biodiversity, Aquatic Environment

General Requirements

In this disclosure, we focused on the marine civil engineering business, which was identified as having a high environmental impact within the domestic civil engineering business, a core pillar in our business portfolio. As priority areas with high nature-related risks, we selected domestic construction sites for marine civil engineering projects. We also apply a double materiality approach, which places importance on both the impact of nature-related issues on the Company and the impact of our business activities on the natural environment.

Governance

Nature-related issues are deliberated by the Sustainability Promotion Committee, chaired by the President, CEO and Representative Director. The committee formulates Action Guidelines on Biodiversity, evaluates dependencies and impacts, analyses risks and opportunities, and reports the findings to the Board of Directors.

Strategies

In line with the LEAP approach, we determined the assessment scope, evaluated dependencies and impacts, assessed risks and opportunities, and formulated our countermeasures. Regarding risks, based on an analysis of direct dependencies on and impacts on nature for each type of work, we identified specific risks such as changes in seabed topography, water pollution, discharge of hazardous substances, and illegal waste dumping. Identified opportunities include increased number of secured orders for projects dredging and sediment disposal by leveraging our proprietary technologies, and the creation of blue carbon ecosystems.

Major Risks

Type of Work	Dependencies and Impacts on Nature	Related Laws and Regulations	Types and Details of Risk
Dredging, Earth Disposal	[**Changes in seabed topography**] Disturbance of habitats of marine life [**Water pollution**] Impacts on ecosystems due to pollution or oil spill	**Basic Act on Biodiversity** **Act on Prevention of Marine Pollution** **Water Pollution Prevention Act** **Act on Waste Management**	**Transition risk—Reputation:** Risk of being criticised for negative impacts on marine ecosystems **Transition risk—Liability:** Risk of legal violations and associated response costs
Ground Improvement (Land)	[**Water pollution and discharge of hazardous substances**] Impacts on ecosystems due to pollution or hazardous substances [**Illegal dumping**] Outflow of dumped plastics and other materials into the sea and their conversion into microplastics		
Ground Improvement, Foundation Work, and Superstructure Work (Breakwaters and Revetments)	[**Changes in seabed topography**] Disturbance of habitats of marine life [**Water pollution**] Impacts on ecosystems due to pollution or oil spill		
Foundation and Superstructure Work (Wind Power Generation Facilities)	[**Noise and vibration**] Adverse effects on marine life [**Water pollution**] Impacts on ecosystems due to pollution or oil leakage [**Water pollution and discharge of hazardous substances**] Impacts on ecosystems due to pollution or hazardous substances		

Key Opportunities

Type of Work	Categories of Opportunities		Outline of Opportunities	Details of Opportunities
Dredging and Sediment Disposal	Corporate Performance	Market	Increase in orders through proposals utilising proprietary technologies (Calcia drop mixing vessel and tremie pipe)	・Growing environmental awareness drives increased demand for technologies such as Calcia-improved soil, creating expanded opportunities for related construction work and improving the utilisation of our proprietary Calcia drop mixing vessel
		Products and Services		
	Sustainability Performance	Restoration and Regeneration of Ecosystems	Creation of ecosystems through the use of Calcia-improved soil made from dredged soil	・Creation of biological habitats by the remediation of deep trenches and development of shallow areas using Calcia-improved soil ・Created shallow areas facilitate carbon sequestration through the formation of blue carbon ecosystems, while also contributing to the securing of fishery resources ・Quantification of CO_2 absorbed by newly formed seagrass beds enables the certification and issuance of J Blue Credit*
		Preservation of Ecosystems	Preservation of ecosystems by utilising dredged soil	・Repurposing dredged soil as Calcia-improved soil reduces the volume of dredged soil, thereby extending the remaining capacity of disposal sites ・Reducing the volume of dredged soil for disposal eliminates the need for new site development or expansion, thereby minimising negative impacts on ecosystems

Calcia Improvement Technology ▶P43

Metrics and Targets

In our construction business, to appropriately monitor and disclose environmental impacts, particularly across aquatic and marine aquatic areas, by using metrics such as land-use change, pollution, and resource use, we have set indicators related to our material issues. In particular, for land-use changes in terrestrial, freshwater, and marine areas, our disclosures include the area of blue carbon ecosystems created, as well as our actions to address major opportunities.

Examples of global disclosure metrics

Metric no.	Factors of Natural Change	Indicators	The Group's Disclosure Content	Targets
C1.0	Land use changes in terrestrial, freshwater, and marine areas	Total spatial footprint	・Area of blue carbon (J Blue Credit*) creation ・Number of projects involving the conservation, restoration, and creation of shallow areas and tidal flats ・Number of projects involving the conservation, restoration, and creation of biological habitats	web ESG Data Sheet
C1.1		Extent of land use changes in terrestrial, freshwater, and marine areas		

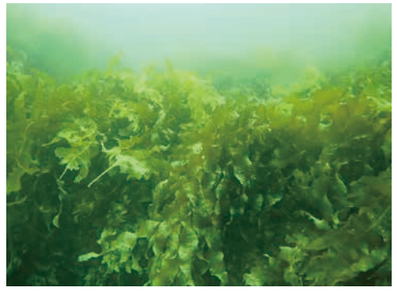
Our Initiatives Contributing to a Nature Positive Future

Because the construction business is intrinsically linked to natural capital, we undertake diverse initiatives to conserve and restore biodiversity, including mitigating construction impacts, environmental conservation, transplanting corals and seagrass beds and restoring tidal flats near construction sites, and creating shallow areas using Calcia-improved soil. We regard TNFD disclosure as an opportunity for enhancing our strategy formulation and for business opportunities, and will advance our initiatives going forward.

・Creation of Blue Carbon

Shallow areas created using Calcia-improved soil and other materials foster formation of seagrass beds and serving as habitats for fish and shellfish. Seaweed also absorbs CO_2 and sequesters it as blue carbon. Leveraging our dredging and sediment disposal works as opportunities, we conduct monitoring after seagrass beds creation to verify increases in catch and CO_2 absorption by seagrass beds and obtain registration of J Blue Credit**.

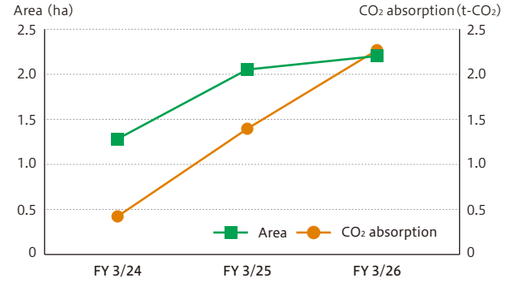
* Carbon credits issued based on calculation of the amount of CO_2 absorbed by blue carbon ecosystems. Certified, issued, and managed by the Japan Blue Economy Association, which is authorised by the Ministry of Land, Infrastructure, Transport and Tourism.



Status of Seagrass Bed Formation



Fishery Surveys



Seagrass Bed Area and CO_2 Absorption in the Aboshi District, Hyogo Prefecture

・Conservation, Restoration, and Creation Projects for Shallow Areas, Tidal Flats, etc.

In the Tamagawa Sky Bridge construction project, to minimise impacts on tidal flat organisms, we kept dredging to a minimum and used the surface soil of removed tidal flats to restore them as part of our efforts to restore the environment to its pre-construction state.



Tamagawa Sky Bridge



Restoration of Tidal Flats

・Conservation, Restoration, and Creation Projects for Biological Habitats

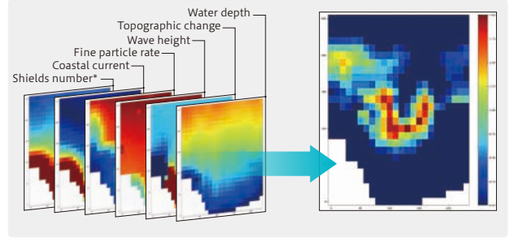
For seaweed to thrive, they require stones or substrates that seaweeds adhere and grow. We are also developing Calcia artificial stone, a lower-carbon material than concrete, that facilitates seaweed adhesion and growth compared to concrete. In creating habitats for seagrass beds and corals, we identify optimal sites based on environmental conditions appropriate for growth (water depth, wave height, amount of topographic change, etc.) and develop transplantation technologies.



Development of Substrates for Seaweed Attachment



Mechanical Transplantation of Seagrass Blocks



* Shields number: Used to calculate the movement of seabed sand

Suitable Site Selection Using Simulations

Resource Recycling

Materiality
Creation of a Rich Environment

The Penta-Ocean Construction Group utilises construction-generated soil, dredged soil, waste, and other materials generated during construction as resources. By commercialising our recycling operations and value-added applications, we contribute to the formation of a recycling-oriented society.

Development of Resource Recycling Technologies

Calcia Improvement Technology

Calcia Improvement technology improves the physical and chemical properties of soft dredged soil generated during port construction work by mixing it with Calcia improving material (a material made by controlling the composition and adjusting the particle size of converter steelmaking slag generated in the steelmaking process), thereby enabling the effective use of the dredged soil. The Calcia-improved soil produced using the Calcia Improvement technology can be widely used in port construction work as landfill material, material for creating shallow areas, backfill material for deep excavation pits, etc.
We have long focused on Calcia Improvement technology as an effective method for utilising dredged soil, and are also engaged in the development of large-scale construction technologies, the construction of drop-mixing vessels for Calcia-improved soil that enable efficient construction, and the development of dredging and underwater placement technologies with a low environmental impact.

Overview of the Calcia Improvement Technology


Soft Dredged Soil


Calcia Improving Material



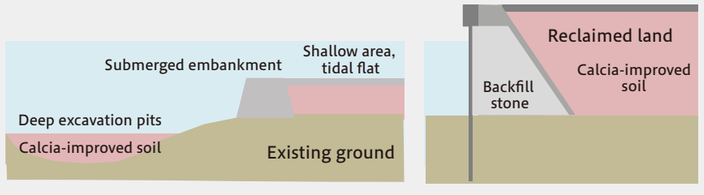
Calcia-improved soil

Calcia-improved soil can be used in a wide variety of applications including landfill material, levee widening material, embankment material, filling material, etc.


Dredging with a Grab Dredger


Transport of Dredged Soil by Hopper Barge


Construction Using a Calcia-improved Soil Drop-Mixing Vessel

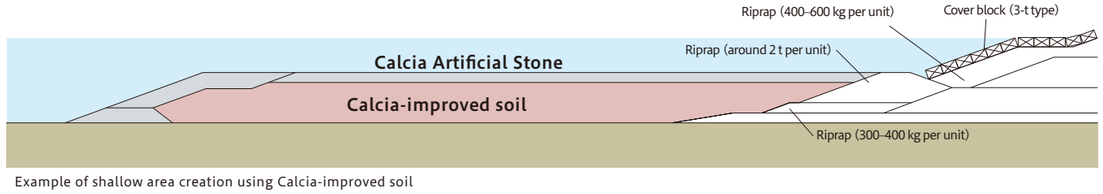


Images showing the different ways Calcia-improved soil can be used


Tremie Pipe for Underwater Placement with Low Turbidity Generation

Application of Calcia Improvement Technology in the Creation of Shallow Areas, etc.

Using Calcia-improved soil as filling material for shallow areas allows solidification to progress, thereby suppressing settlement. In addition, placing high-strength Calcia Artificial Stone (artificial stone made by mixing dredged soil with steelmaking slag, ground granulated blast-furnace slag, etc.) on the surface of shallow areas suppresses erosion caused by waves and currents, while also providing a substrate for seaweed attachment.



Example of shallow area creation using Calcia-improved soil

Development of Recycling Businesses

To recycle by-products generated by a variety of industries in each region, the Penta-Ocean Construction Group is actively developing recycling businesses throughout Japan. We establish resource recycling hubs and networks in each region, collecting by-products within the region and recycling them into resources. The recycled products are utilised both within the region or transported nationwide via land and sea networks, promoting wide-area cyclical use.

Wide-Area Recycling Business for Construction-Generated Soil and Construction Sludge (Sand Techno Co., Ltd.)

The Ichikawa Soil Recycling Center expanded its facilities in 2014 and, in addition to its existing marine transportation business for construction-generated soil, it now accepts contaminated soil. It transports construction-generated soil from the Kanto region to all parts of Japan, promoting wide-area cyclical use. In 2018, we also opened a soil recycling centre in Nagoya, and are advancing the wide-area recycling of construction-generated soil and sludge from the Chukyo region as raw material for cement.

Construction Sludge Recycling Business (Jaiwat Co., Ltd. and Sand Techno Co., Ltd.)

We engage in construction sludge recycling businesses in Sendai City and Ichikawa City. Sendai Ecoland, which has marked 26 years since opening, granulates and solidifies inorganic sludge and recycles it into high-quality recycled sand. Sand Techno in Ichikawa City constructed a plant for producing liquefied stabilised soil in 2020 and is accepting construction sludge generated in the Kanto region and selling the recycled product.


Before Treatment → After Treatment

Stabilisation Material Manufacturing Business Using Paper Sludge Incineration Ash (Jaiwat Co., Ltd.)

We manufacture the water-absorbing mud stabilisation material "Watoru" by mixing a special chemical with paper sludge incineration ash generated by paper factories. "Watoru" is a soil stabilisation material with both a water-absorption effect (instantaneous physical improvement) and a chemical stabilisation effect (gradual strength development). The material received the Infrastructure Technology Development Award (Excellence Prize) in 2021 and is highly regarded as a high-performance environmental material.

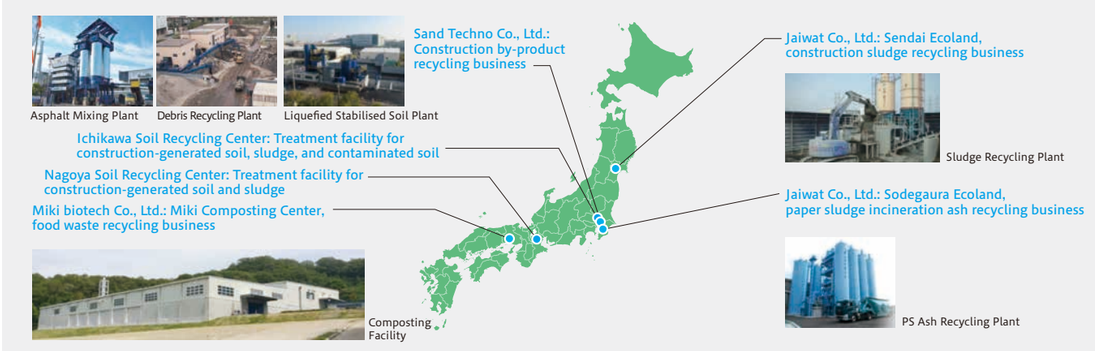


Food Waste Composting Business (Miki biotech Co., Ltd.)

Located in the Kinki region, home to numerous food factories, the Miki Composting Center accepts food residues generated by beverage manufacturers, food processing companies, and prepared-food manufacturers, and ferments and matures them over an extended period to produce the compost product "Minami-no-Hikari" (certified under the Compost Quality Certification programme). In addition to recycling food waste, this contributes to soil improvement for individual farmers and farming cooperatives.


Food Waste → Compost Product

Resource Recycling Business Network



Collaboration with External Parties

The Penta-Ocean Construction Group actively engages in the development of technologies in the resource recycling field in collaboration with external companies and organisations.

Examples of Collaboration with External Companies and Other Parties

Details	External companies and organisations
Cooperated in a demonstration project for wide-area utilisation of recycled aggregates and base course materials via rail container transport https://www.penta-ocean.co.jp/english/updates/2025/250924.html	Japan Asphalt Mixture Association
Obtained a technical evaluation certificate for a new construction method using Calcia-improved soil, a green material utilising steel slag https://www.penta-ocean.co.jp/english/updates/2023/230705.html	JFE Steel Corporation, Nippon Steel Corporation, Toa Corporation, and Nippon Kaiko Co., Ltd.

web Resource Recycling