

Creation of a Rich Environment

Environmental Initiatives

Our company is working on manufacturing technologies in consideration of preservation of rich global environment, in order to enhance biodiversity (diversity of ecosystems, diversity of species, and diversity of genes). To create a future in which people and nature coexist, we are conducting research and development based on the technology and experience we have acquired through various construction projects.

Basic Environmental Guidelines

1. We shall contribute to a recycling-oriented society and preserve the natural environment by taking measures to reduce global warming.
2. We shall prevent environmental accidents.
3. We shall enhance mutual communication with local communities and conduct eco-friendly planning and construction, while developing technologies to preserve and restore the environment.
4. We shall communicate with all our stakeholders to enhance their awareness of the importance of environmental preservation.

Effective Use of Soft Dredged Soil (Calcia Reforming Technology)

Outline

Calcia reforming technology improves the physical and chemical properties of dredged soil by mixing the soft dredged soil generated from the port works with the calcia reforming material (materials for controlling the composition and adjusting the particle size of steelmaking slag from converter system) generated in the steelmaking process.

Calcia reformed soil improves the strength of soft dredged soil and ensures long-term durability, so it is effective for consolidation settlement and liquefaction countermeasures. It is also possible to prevent and control the elution and pollution of hazardous substances and to form slopes during construction. By taking advantage of these features, this method can be applied to a wide range of port works, including landfill materials, filling materials for inner walls, filling materials for seawalls, and submerged breakwaters to prevent sea-lanes from being buried. This method is expected to shorten construction periods and reduce costs.

Our company has developed a high-performance calcia reforming technology using short fibers and mud improvement materials and is working on dredged soil recycling at ports.

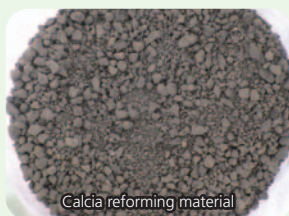
Overview of the Calcia Reforming Technology



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The mixing ratio of calcia reforming material is generally 20% to 40% of the volume of dredged soil, and it can be widely used as landfill material, lining, embankment and filling materials.



+ Short fiber

Adding short fiber enhances toughness and strength, and the material can be applied to bottom impervious layer and prevention of water absorption.



+ "Watoru", Water-absorbing mud reforming material, Wattle

It is a material to which Watoru, a water-absorbing mud reforming material, is added. It can secure strength when dredged soil is not strong due to high moisture content. When Watoru is added to dredged soil with a normal moisture content, it can be used to backfill soil, submerged dike etc., as it suppresses fluidity.



+ Blast furnace cement

It is artificial stone material added with blast furnace fine powder and blast furnace cement, and it can be applied to lining stones, submerged dikes, algae reefs, etc.



Awards and Technical Evaluation

"Calcia reformed soil"

- Received the 19th National Land Development Award
- NETIS registration CKB-150001-A
- Ministry of the Environment Environmental Technology Demonstration Project 090-0901
- Basic certification for a restoration technology for the environment in fishing areas (Japan Fisheries Science and Technology Association) No. 26001

"Fiber-reinforced calcia reformed soil"

- Obtained the technical evaluation certificate (No. 17001) from Coastal Development Institute of Technology

Obtained the “ZEB” Certification for Hisamitsu Pharmaceutical Museum

Hisamitsu Pharmaceutical Museum achieved an energy saving rate of 103% including energy generation, and it received the “Zero Energy Building (ZEB) certification,” which is the highest rank “☆☆☆☆☆” of the Building-Housing Energy-efficiency Labeling System (BELS). This is the first ZEB certification acquired in Saga Prefecture.

The building was a project commemorating the 170th anniversary of Hisamitsu Pharmaceutical Co., Inc., and the construction was completed in February 2019. World-renowned Italian sculptor Cecco Bonanotte was in charge of the basic design. In response to the promotion of their “CSR activities aimed at the development of an affluent society and global environmental conservation,” we made a technical proposal for ZEB.

In making a proposal for ZEB, we achieved a high energy-saving rate through measures such as strengthening roof insulation, energy-saving air conditioning equipment, and operation control of equipment using various sensors. A solar power system is used for energy creation, and solar panels are placed on the roof surface to the maximum to secure a large amount of electricity throughout the year. In addition, the installation height and installation angle were taken into consideration so that the solar panels are not visible from the ground. After completion, we will monitor and analyze the energy consumption during the building use, so that we can accumulate the expertise of automatic operation control by validating the effects of the adopted technologies.



■ Hisamitsu Pharmaceutical Museum Construction Overview

Location: 427 Tashiro Daikancho, Tosu City, Saga Prefecture	Shinko special construction enterprises
Client: Hisamitsu Pharmaceutical Co., Inc.	Scale: Total floor area 687.63 m ²
Design and supervision: Yasui Architects and Engineers	Structure: Reinforced concrete, 2 floors above ground
Construction: Penta ocean construction and	Completion: February 2019

What is BELS?

BELS is an abbreviation for Building-Housing Energy-efficiency Labeling System. It is a system in which a third-party evaluation organization evaluates and certifies energy-saving performance in new and existing buildings. ☆ is displayed in 5 stages according to performance.



BELS “ZEB” plate

What is ZEB?

It is an abbreviation for Zero Energy Building. It is a building that aims to reduce its annual primary energy balance to zero while realizing a comfortable indoor environment. Energy consumption cannot be reduced to zero because of human activities in the building, but energy consumption is reduced to net-zero through energy saving and on-site creation of required energy.

<Method>

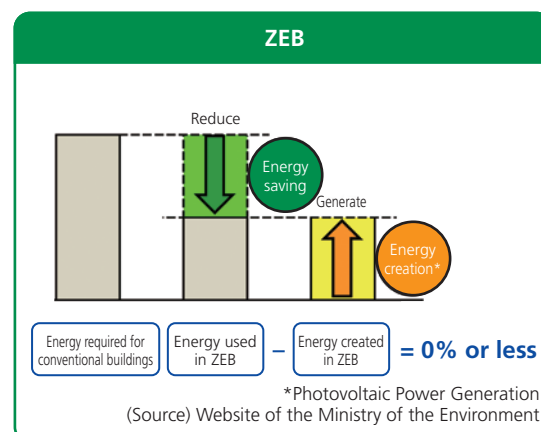
Outer skin specification: Insulation reinforcement of roof

Air conditioning equipment: Adoption of high-efficiency air conditioning, system subdivision operation control

Ventilation equipment: High efficiency ventilation fan, operation control by a CO₂ sensor

Elevator: Addition of power regeneration function

Energy creation: Solar power generation



Recycling Business

Construction Sludge Recycling Business (Sendai Ecoland)

① Overview of the business

This business promptly processes inorganic sludge from construction work and drilling work (certain type of sludge which cannot be reused, such as cement-bentonite mixture, construction sludge having a high moisture ratio, etc.) into construction material “Shimarussa (reconditioned sand).”

② Characteristics of the business

- Since construction sludge, which is industrial waste, goes through the granulation and solidification process without pretreatment (dewatering, drying, etc.), water pollution, noise, vibration, dust, etc. never occur, preventing any impact on the surrounding environment.
- Construction sludge having a high moisture ratio can be granulated and solidified in just a few minutes.



③ Use of recycled product “Shimarussa (reconditioned sand)”

Since the treated soil has sufficient strength with properties of high-quality sand and gravel, it can be used as civil engineering material.

Main construction projects that generate sludge

- Shield work, propulsion work • Basic construction work • Dredging work
- SMW, continuous wall construction • Soft ground excavation, etc.



Sludge treatment plant

*This business is conducted by JAIWAT Co., Ltd. (our wholly owned consolidated subsidiary)

Food Waste Recycling Business (Miki Composting Center)

① Overview of the business

This business processes and sells compost materials made from organic waste discharged from food-related companies, etc.

② Characteristics of the business

- With the automatic agitator (scoop-type) and the forced air circulation (aeration), collected food waste is subject to primary fermentation for about 1 month, and then further fermentation and maturation for about 3 months to produce complete compost.
- Since the Miki Composting Center is located near the Hanshin district with concentration of many food-related companies and easily accessible from interchanges of the expressway, it can contribute to the reduction of waste transport costs.



Inside the facility



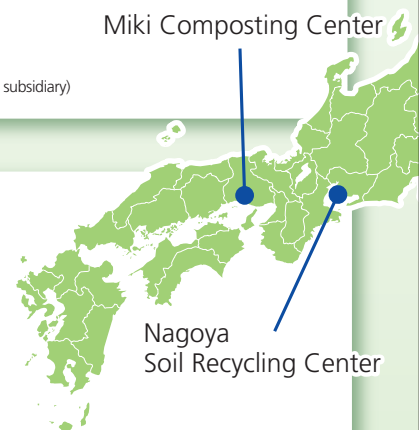
Panoramic view of the facility



Product “Minami-No-Hikari”

③ Use of recycled product (compost “Minami-No-Hikari”)

Made from recycled food waste, not only is this product nature-friendly and safe compost, it also is free from unpleasant odors because it is fermented and matured for a long time. It can be used for a variety of applications including full-scale agriculture, landscape gardening, greening, and private vegetable gardens.



*This business is conducted by Miki Biotech Co., Ltd. (our wholly owned consolidated subsidiary)

Paper Sludge Incineration Ash Recycling Business (Sodegaura Ecoland)

① Overview of the business

This business manufactures a water-absorbing mud stabilization material "watoru" made from paper sludge incineration ash discharged from papermaking companies, and supplies it for construction.



Panoramic view of the facility

② Characteristics of the business

- The material is harmless and extremely safe, since it undergoes chemical treatment using special chemicals.
- This is a mud improving material with two characteristics: instant improvement effect and gradual strength development property.
- Includes three main components: calcium, silicon, and aluminum.
- Has high water absorbing and deodorizing properties.
- Reformed soil demonstrates eco-friendly, neutral to slightly alkaline pH levels. Unlike the case of cement treatment, it is not solidified.



③ Use of recycled product ("Watoru," a mud stabilizing material)

This product is suitable for the treatment of dredged soil in ports, rivers, and lakes, as well as mud and sludge generated in the course of excavation work on land.

Example of using Watoru



Before treatment with Watoru



After treatment with Watoru

*This business is conducted by JAIWAT Co., Ltd. (our wholly owned consolidated subsidiary)

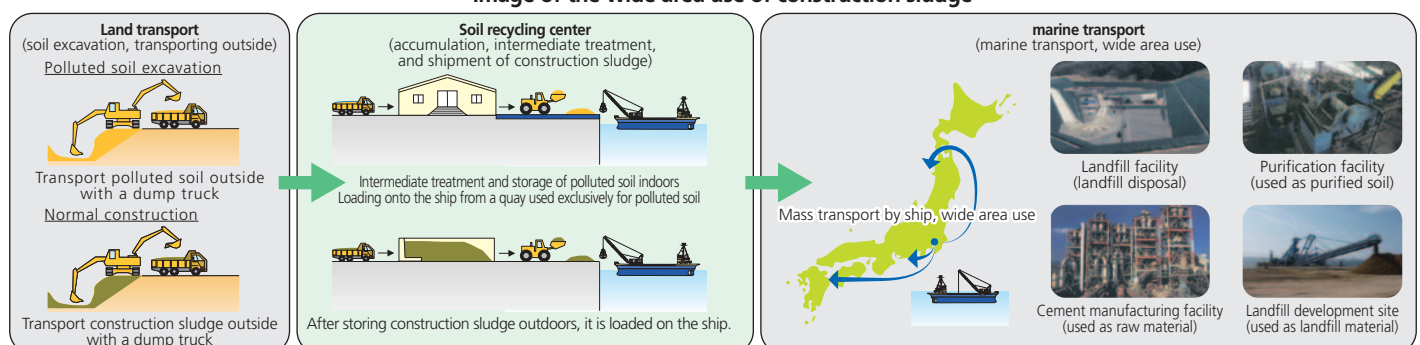
Construction Sludge Business for Wide Area Use

● Ichikawa Soil Recycling Center ● Yokohama Soil Recycling Center ● Nagoya Soil Recycling Center

① Overview of the business

This business operates Soil Recycling Centers (in Ichikawa, Yokohama, and Nagoya) that perform accumulation, intermediate treatment, and shipment of generated sludge to recycle construction sludge and contaminated soil generated in the Kanto and Chubu regions over wide areas.

Image of the wide area use of construction sludge



② Characteristics of the business

- Helps reduce the transport distance of trucks by making the most of our positional superiority in the Kanto and Chubu regions.
- Adopts a 24-hour acceptance system.
- Allows mass transport by a large ship using of the quay which can dock up to a 10,000t class ship.



Ichikawa Soil Recycling Center



Yokohama Soil Recycling Center



Nagoya Soil Recycling Center