Priority issue 4: Conservation of biodiversity — Aiming for a society in harmony with nature

Our activities in this field are guided by the Kajima Biodiversity Guidelines. With the ongoing goal of creating biodiverse "Kajima Biophilic Cities," we are strengthening urban ecological networks through business activities. The mission of our construction business is to carry out initiatives that enable human activities and communities to exist in harmony with diverse ecosystems.

Initiatives in fiscal 2012

In fiscal 2012, Kajima made proposals for biodiversity creation as part of three civil engineering and 20 architecture projects. In fiscal 2013, the proposals will be reviewed, standards will be set befitting a biodiversity network base, and the level of activities will be increased.

Kajima is also being proactive in the area of communication, education and public awareness (CEPA). This includes lectures in the Minato Ward of Tokyo and at the COP 11 Convention on Biological Diversity. We also regularly feature biodiversity initiatives on our Biophilic City Design website.

Promoting biodiversity through construction projects

Based on our pioneering technology development relating to biodiversity, Kajima shares concepts with business owners from the business planning stage. We provide proposals and support in order to increase the added value of each project. Throughout the project, Kajima uses both tangible and intangible approaches, with activities such as education support and monitoring of nearby agricultural land after project completion.

Initiatives for harmony with nature in construction processes

In construction projects, measures to monitor and protect the surrounding natural environment are becoming increasingly important. Kajima is working on these measures from various angles. This includes the incorporation of software-based ecosystem monitoring methods from the construction planning stage, and the development and use of building materials for resource recycling.

■ Ikimono Note system monitors plants, animals, and the environment

Mapping images of plants in the surrounding area and their locations using a tablet device

In large-scale civil engineering projects such as dam construction and land reclamation, conservation measures need to be taken that are specific to the natural environment, as well as to the plants and animals in and around the construction zone. Also, since the worksite terrain conditions change on a daily basis, the environmental protection measures need to be optimized. In order to meet these needs, Kajima developed the Ikimono Note tablet-PC system for monitoring plants, animals and the environment.

For the Gokayama Dam construction project currently being carried out in Fukuoka, Kajima conducts daily environmental patrols using this system. As a result, we are able to easily record and verify the biotope protection effects, enabling the protection of the small birds of prey in the area, such as the grey-faced buzzard. Kajima's policy is to expand the use of the Ikimono Note system across our construction projects, as a tool to support natural environment conservation.

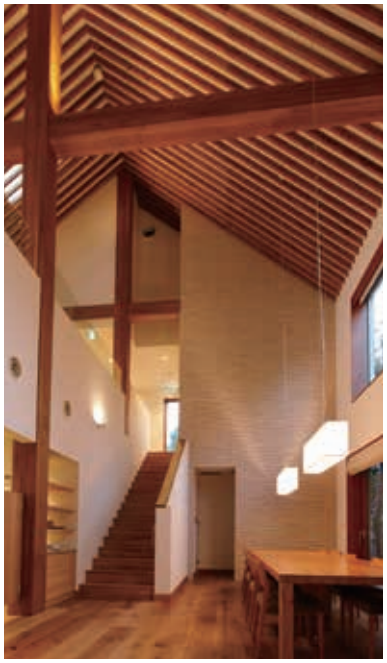
■ Promoting use of lumber

Kajima manages about 1,000 hectares of company-owned forests in ten locations across Japan. Utilizing the experience we have developed over many years, including tree thinning methods, Kajima also carries out forest conservation activities with various local governments.

Compared to other building materials, the amount of CO_2 emitted during lumber milling is small. Since trees continue to hold their carbon even after processing, they contribute toward all three target social conditions of low-carbon, resource recycling, and harmony with nature.

FR Wood, which is fire resistant, is made entirely from Japanese-grown cedar and is used in all-wood fire-resistant construction. This unique product was developed jointly by Kajima, the Tokyo University of Agriculture and Technology, the Forestry and Forest Products Research Institute, and T. E. Consulting. This is the one and only technology in Japan capable of delivering this level of fire-resistance. Even in the event of a fire, flames will not progress into the internal structure of a building made of this wood. As a result, in March 2012, FR Wood passed Japan's strict fire-resistance building codes, and was even approved for use as smaller dimension lumber.

In addition to traditional wooden buildings, Kajima plans to offer new structures using FR Wood mixed with steel frame construction and reinforced concrete. This could become a driving force for establishing cycles of forest planting, harvesting, and use, based on a desire to revitalize the Japanese forest industry.



Otonoha Green Cafe featuring pillars and beams made from Fire Resistant wood (Bunkyo-ku, Tokyo)

Donated to the local community – table and chairs made from a memorial tree on the grounds of the old Aoyama Elementary School, lost in dam construction (Tobetsu Dam construction, Hokkaido)

Construction site fence made from thinned wood from the village of Doshi, Minamitsuru, Yamanashi Prefecture (new building construction as part of redevelopment at the north entrance of Nagatsuda Station, Kanagawa Prefecture)

Kajima Biodiversity Guidelines

The company adopted the Kajima Action Plan for Ecosystem Conservation in August 2005, and conducted a number of activities in accordance with it. Kajima revised the Plan in September 2009, renaming it the Kajima Biodiversity Guidelines, with the aim to give more consideration to biodiversity issues.

Basic Philosophy

As a company with "a vision for all eras," Kajima is pursuing its mission of maintaining a rich environment for future generations and building high-quality social infrastructure for society.

The deterioration of biodiversity, which affects the environment around the world, along with global warming are monumental issues of our time—and companies have a major role in finding solutions.

Kajima will take initiatives for the conservation and sustainable use of biodiversity through its related activities in its construction business, with the overall objective of contributing to realizing a society in which people and nature can harmoniously coexist.

Guidelines

Participation of All Employees

Kajima shall promote company-wide efforts for the conservation and sustainable use of biodiversity by raising awareness of the value of nature among its employees and disseminating information on biodiversity.

Development of the Construction Industry

Kajima shall aim for the conservation and sustainable use of biodiversity by offering proposals that make use of information and technology related to biodiversity and promoting environmental considerations at construction sites.

Improvement of the Supply Chain

Kajima shall aim to reduce the impact on biodiversity by improving the supply chain for construction materials and office supplies.

Pursuit of Research and Development

Kajima shall accumulate information and technical expertise related to the conservation and sustainable use of biodiversity, and pursue research and technology development in this area.

Consideration of Social Demands

Kajima shall not only comply to laws and regulations related to biodiversity, but also respect related policies and social demands, and apply its expertise in this field to its construction business.

Promotion of Communications

Kajima shall share its achievements and research results related to the conservation and sustainable use of biodiversity and promote cooperation and dialogue with stakeholders, including clients, local communities, public administrations, research institutes, private enterprises, and NGOs.

Building the future: Renewable energy and Kajima

After the Great East Japan Earthquake in 2011, Japan reached a major turning point in its basic energy plan. There is a need to diversify the country's energy sources to include more renewable energy sources, such as wind and solar power. As a member of the construction industry, Kajima is helping to solve this major social issue by becoming broadly involved in renewable energy projects that make the most of the power of nature.

Completion of Japan's first offshore wind turbine

An offshore wind turbine and meteorological tower has been set up 3.1 kilometers off the coast of Choshi, Chiba Prefecture. This demonstration research project was initiated by the New Energy and Industrial Technology Development Organization (NEDO) and the Tokyo Electric Power Company, Inc.

The results of the project have raised expectations that this technology is suitable for Japan despite being a country prone to typhoons and earthquakes.

This was the first full-scale project of its kind in Japan. The order was placed by Tokyo Electric Power. Kajima was tasked with designing and constructing the foundation of the wind turbine and the entire meteorological tower.

Installation of the wind turbine caisson

For the design of the turbine foundation, we combined our expertise in coastal civil engineering with our extensive experience in designing land-based wind turbines. Based on wave observation conducted in advance at the offshore site, Kajima confirmed structural safety by creating a model of the project in the large hydrology laboratory at the Kajima Technical Research Institute. The tsunami wave observed at the site just after the Great East Japan Earthquake was recreated in the laboratory for testing. Considering that the foundation would be built on land and transported to the project site, a gravity-type concrete caisson design was used that could be filled at sea.

To install the wind turbine, two large self elevating platforms (SEPs) were used. Various preparations were made in order to safely transport personnel to the offshore site and carry out the installation at sea. Kajima will continue to devise new technologies to meet the needs of customers and society.

Rebar and PC steel wire used to make a foundation for an offshore wind turbine caisson

Installed offshore wind turbine using large self-elevating platforms