

# Resource Recycling and Effective Use, and Hazardous Materials Management

Kajima has adopted zero emissions as a company-wide goal, while its branches and worksites have also set their own goals. In addition, the company is working to clean up naturally occurring soil contamination, and formulating in-house rules for asbestos management.

## Priority Issue 2

### Waste Reduction Initiatives—Striving for Zero Emissions

Construction site waste varies widely in terms of type, volume, and treatment method, depending on the surrounding environment and type of

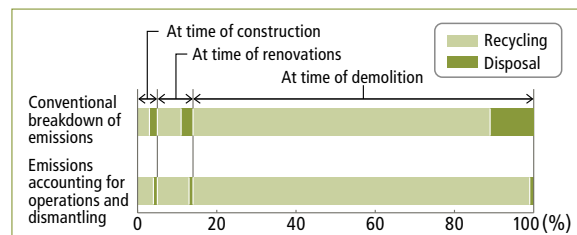
construction. Kajima has adopted a company-wide target for its final disposal rate, i.e. the percentage of total waste material that is not recycled. A project with a final disposal rate of under 5% is defined as having achieved zero emissions.

#### Case study A project with a focus on life-cycle emissions

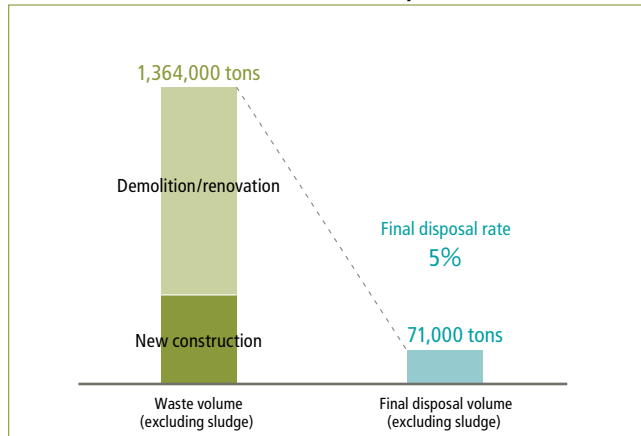
Kajima provided the construction services for the newly built Honda engine plant in Ogawa City, Saitama Prefecture, while design was handled by Nihon Sekkei.

The project owner, designer, and builder in this case all agreed on a design concept that called for the use of 100% recyclable materials. Among construction projects involving structures intended to last for a very long time, this was the first project ever in Japan to adopt a goal of zero emissions over the entire life cycle of the premises, including initial construction, future remodels or renovations, and demolition.

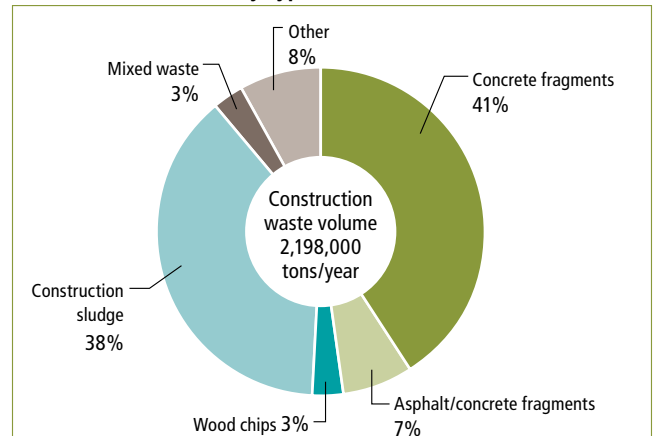
Kajima selected materials and building methods for ceilings and partitions that would render them easily dismantled, and procured only outer finishing materials for which a recycling route was already established. As a result, the expected recycling rate is approaching 100% – 98% for exterior materials and 97% for interior materials upon demolition.



Construction waste volume and final disposal volume in FY2008



FY2008 waste volume by type



**Priority Issue 2**

## Waste Management

### Selection of a waste handling firm

Waste handling contracts, which provide for the treatment of mixed waste, construction sludge, waste asbestos, and other such industrial waste, are not established separately for each construction site, but are entered into between waste treatment contractors and the manager of each Kajima branch. An environmental officer at a given branch inspects the facilities of waste treatment contractors to determine whether they meet Kajima's requirements, and draws up a list of qualified firms. Those in charge of individual construction sites within the territory covered by that branch then select a waste treatment contractor from the list. This approach ensures proper treatment of waste and lessens administrative burdens for both construction site operators and waste treatment contractors.

#### Adoption of Electronic Manifests

In order to properly manage the risks associated with waste treatment, a push is on to promote the use of electronic manifests at all Kajima branches, and the new reporting forms are already in use at 40% of the branches. Electronic manifests are a boost to paperless operations, and can help to reduce recording errors and the loss of manifest forms.

**Priority Issue 3**

## Hazardous Materials Management

### Naturally occurring heavy metal pollution in soil

Heavy metals such as arsenic and lead are well known for their harmfulness to human health, and are commonly present in nature. Care must be taken to ensure that contamination is not spread when soil is dug up in one place and transported to another. Accordingly, Kajima always works with its customers to check for naturally occurring pollutants before transporting soil that may be contaminated.

#### Handling of Polluted Soil on Company Land

Kajima conducts geotechnical and environmental surveys on all company-owned land and undertakes field investigations before land transactions and earth works. If pollution is discovered, the pollutants are removed and the matter is publicly disclosed. In the one geotechnical and environmental survey conducted in 2008, no pollution was found.

Construction surplus soil:	898,000 m <sup>3</sup>
Volume of hazardous materials treated:	
Material containing asbestos	7,100 tons
CFCs and halon recovered	9 tons
Number of devices containing PCB	368
Fluorescent tubes	38.4 tons

### Construction waste volume and final disposal volume

Figures in parentheses exclude construction sludge.

	Waste volume (tons)	Final disposal volume (tons)	Final disposal rate	Mixed waste volume (tons)
FY2005	2,497,000 (1,476,000)	301,000 (116,000)	12 (7.9) %	83,000
FY2006	2,543,000 (1,579,000)	316,000 (106,000)	12 (6.7) %	81,000
FY2007	3,672,000 (2,792,000)	181,000 (91,000)	5 (3.3) %	76,000
FY2008	2,198,000 (1,364,000)	245,000 (71,000)	11 (5.2) %	73,000

\* Some figures for FY2007 have been changed to reflect an unordinary amount of concrete debris resulting from disaster-relief work following a major earthquake in Niigata.

### Final disposal rate by type

	Asphalt/ concrete fragments	Concrete fragments	Construction sludge	Mixed waste	Wood chips
FY2005	1.1%	0.9%	19.7%	36.3%	4.0%
FY2006	1.1%	1.4%	18.9%	37.4%	5.3%
FY2007	0.1%	0.4%	10.2%	21.5%	1.2%
FY2008	2.0%	1.4%	20.9%	29.6%	2.4%