Our final goal is to contribute to the realization of a sustainable society through the study of construction materials, mainly concrete, to develop a sophisticated recycling system and to build long-lasting structures.

**Complete recycling of concrete waste**

We are developing a new recycling technique that produces zero by-products and does not require new materials to recycle concrete waste.

**Deterioration mechanisms**

We are trying to understand the deterioration mechanisms of concrete structures due to freezing and thawing, chloride attack, etc. using model channels.

**Deformation mechanism of concrete**

We observed that hardened cement paste shows large deformation without macroscopic damage under confining pressure. We are trying to understand this mechanism.

**Property change due to high-speed impact**

The microscopic change in concrete due to high-speed impact is not understood well. We are investigating the property change collaborating with the impact engineering laboratory in Ritsumeikan University.

**Analysis via special devices**

We use various special devices, such as FIB-SEM to observe the three-dimensional pore structure of concrete; SPM to measure microscopic surface property; and MRI to observe water permeation into concrete.