

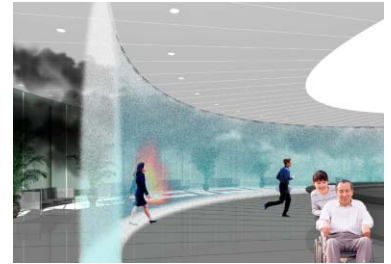
Security for Today and When the Worst Happens

Kajima Corporation's DNA is a spirit of ensuring the safety of people. More than just simply ensuring that its buildings remain standing, we also seek to offer people the peace of mind that their way of life and businesses will be able to continue should a disaster strike. Kajima has established a social contribution program built on its DNA that includes business continuity plans (BCPs), along with early-warning systems, customer support during a disaster, and cooperation with local authorities to quickly restore public infrastructure in a disaster area. Kajima aims to offer security for today and when the worst happens.

Kajima's Water Screen Helps Save the Vulnerable during a Disaster

Fire doors and shutters that halt the spread of flames and smoke, depending on their shape, can actually hinder the escape of the elderly, persons in wheelchairs or being transported on gurneys. They also completely block the view, making it difficult to determine the source of the fire or the amount of smoke present. Kajima is helping to overcome these difficulties with the "water screen," a fire safety system developed to help preserve life. Nozzles placed in a line along the fire control area emit a curtain of ultra-fine water droplets that blocks flames and heat, as well as helps to prevent the spread of smoke. People can easily move through the water curtain in either direction, and also can confirm the source of the flame and smoke through the curtain of water.

The advancement of barrier-free and universal designs has given more and more people the opportunity to participate in society on an equal basis. Kajima's aim is to ensure that no particular group of people is left vulnerable during an emergency.



The soft curtain of water can also create a circular fire control area.

Parallel Frame System Makes Schools Safer

A recent survey (June 2007) by the Ministry of Education, Culture, Sports, Science and Technology (MEXT) revealed that as many as 4,328 public elementary and junior high school buildings throughout Japan were at high risk of collapse during a major earthquake. Making school facilities more resistant to earthquakes is an urgent issue, as much for the role they serve as disaster relief centers as for the protection of children. One of the reasons this has been so difficult, however, is the impact the construction on schools in terms of restricted use of the classrooms, as well as noise and vibration.

The parallel frame system developed by Kajima is an external seismic retrofit fixed as part of an existing building. A foundation and support pillar is placed alongside the building exterior, supported by diagonal steel braces that give it a tree-like shape. The construction work makes little noise and can be completed in a relatively short period of time, and since the slim diagonal bracings do not obstruct the exterior view, ventilation and natural light in the classrooms is sufficiently maintained.



The parallel frame system at Seigakuin Primary School (Kita Ward, Tokyo)



The diagonal bracings were illuminated during the Christmas season.

Support for When the Worst Happens:

Recovery Efforts Following the Niigata Prefecture Chuetsu Earthquake

The majority of the regions devastated during the Chuetsu Earthquake that struck Niigata Prefecture on October 23, 2004, were areas famous for their heavy snowfall. One of the main desires of those afflicted by the earthquake, as well as organizations and individuals responsible for infrastructure, was a minimal recovery before the snow began to fall in earnest. The day after the earthquake, Kajima received a request for disaster recovery assistance from East Japan Railway Company (JR East). One end of the Tenno Tunnel had completely collapsed, including the foundation, and Kajima was given the task of restoring service by the end of the year for at least one line through the tunnel. Employees of JR East, the 100 Kajima employees assembled from around the country, and the representatives from Kajima's



The collapsed western end of the Tenno Tunnel

subcontractors were in full agreement that the line should be reopened as quickly as possible to aid in the recovery of the region. The approach decided upon for the short construction period of just less than two months included many cutting-edge techniques, such as the reinforced earth embankment (3R) method developed by JR East, and Kajima's fiber-mixed concrete spray. More than 200 workers were engaged with the project at its peak, with engineers involved in technical development entering the site on a regular basis, as the diligent effort continued. A hearty cheer rang out when the first train passed safely through the tunnel at the end of the year.



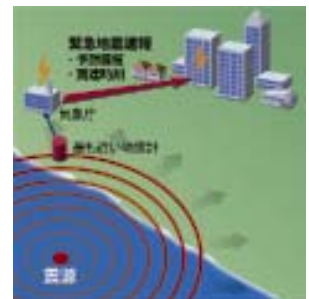
A train makes a test run through the snow-covered Tenno Tunnel.

The site of the cave-in was adjacent to the area of mudslides that trapped a mother and her child in their car as they drove along the prefectural road. In response to a request for assistance from Niigata Prefecture, Kajima aided the Hokuriku Regional Development Bureau of the Ministry of Land, Infrastructure and Transport with its rescue and recovery operations using unmanned construction machinery. These operations were conducted in accordance with agreements between the Development Bureau and the Japan Civil Engineering Contractors' Association Inc. regarding times of disaster. Kajima, having extensive experience with large-scale, unmanned construction operations conducted during recovery efforts following mudslides and landslides caused by the volcanic eruptions of Mount Unzen-Fugendake in Kyushu and Mount Usu in Hokkaido, brought in experienced personnel from its Sapporo branch and other areas as part of a company-wide response. A two-year-old boy was miraculously saved, and the prefectural road was reopened in March 2007.

The Real-Time Disaster Mitigation System Underpins Business Continuity Plans (BCP)

Earthquake planning up to now has focused mainly on preemptive measures such as seismic retrofitting, and *ex post* measures such as recovery plans. Kajima offers strategies for prior to, during and after an earthquake with its Real-Time Disaster Mitigation System (RDMS).

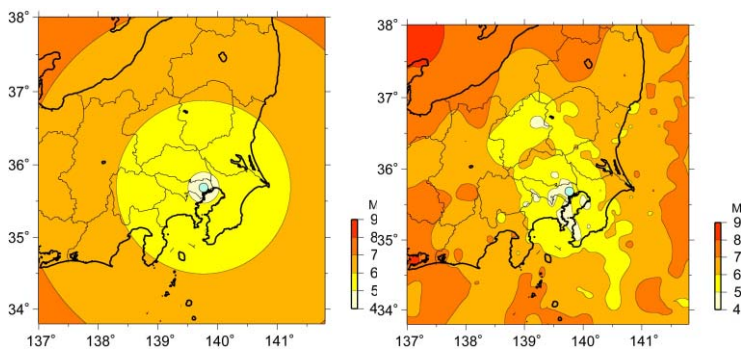
The moment an earthquake occurs, the system receives an instantaneous notice through the emergency reporting system operated by the Japan Meteorological Agency, and uses these data to predict when and at what intensity large shockwaves will strike the particular area where a building is located. Kajima utilizes soil data and analysis methods to determine how the shockwaves will travel from the epicenter to the building location, and instantly calculates the characteristics of the soil in that area. This allows Kajima to provide more precise and effective data on the seismic activity that will occur in any given area.



Overview of the Meteorological Agency's emergency earthquake reporting system

During and immediately after an earthquake, Kajima employs a real-time monitoring system that uses an on-site seismograph to detect the tremors, instantly displaying the type of shaking and distortions of the building overall. This information is then converted into data on the areas of the structural framework and facilities that need to be inspected, and relayed to the building engineer.

Kajima utilizes RDMS at its own project sites to help ensure the safety of its workers, and has installed it for hotel elevator controls and large office buildings. A solid BCP, along with advance planning, requires measures for immediately prior to, during and following an earthquake to ensure a quick recovery. We believe that providing society with earthquake countermeasures in such a full time-sequence network to be part of the duty of a construction company with a long history of operation in such an earthquake-prone country as Japan.



Ordinary forecast

Kajima's forecast

This map represents a supposed earthquake with a seismic intensity of 3 on the Japanese scale of 0 to 7. The ordinary forecast is a simple circular projection where the seismic activity dissipates the further removed an area is from the epicenter, while Kajima's forecast takes into account soil conditions to provide a more detailed prediction.