

Technological Strengths

Rising to the Challenge of Cutting-Edge Technology with Abundant Expertise and Bold Ideas

The history of construction and civil engineering is the evolution of engineering methods, requiring a steadfast resolve to meet the challenges of new technology. Throughout its own long journey, Taisei has accumulated a diverse range of expertise, building upon an impressive track record of achievement. The Company has also introduced many innovative engineering methods, resulting from a willingness to move well beyond conventional approaches. By combining abundant expertise with bold ideas, the Company advances technological innovation across a broad range of fields, from the creation of comfortable living environments to improved safety and reduced environmental impact.

Contributing to the Creation of High-Quality Social Infrastructure

Meeting Demands for More Highly Precise Deep Construction

Underground Drive-Hollow Motor Execution Technology

With cities moving to use underground space more intensively, it is necessary to develop technologies that make possible the high-precision construction of earth-retaining cut-off walls at great depths.

Taisei has participated in the joint development of the world's first Underground Drive-Hollow Motor Execution Technology (UD-HOMET), a type of in-situ churning construction method in which the drive portion of the excavating equipment is positioned where the screw has been discretionarily placed, making it possible to advance the drive portion of the excavating equipment through the earth as excavation takes place. The development of a revolving outer motor makes for a structure in which soil removal is not obstructed even if the drive portion of the machine is located in the screw section. Compared to conventional top-drive machines, this technology makes it possible to excavate and churn with high precision and significantly greater stability. There are leading and flying versions



UD-HOMET

of UD-HOMET, and testing of both in the construction of a tunnel in Osaka is providing verification of high construction precision and low noise levels.

Supporting Safe and Comfortable Living

Reducing Vibrations Caused by Earthquakes and Strong Winds

Hybrid TASS Method

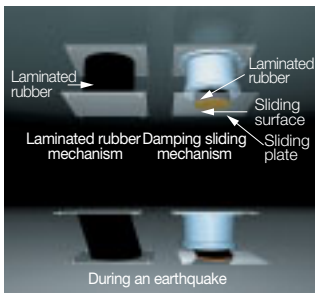
In the wake of the Great Hanshin Awaji Earthquake of 1995, major construction companies in Japan have been working to develop seismic isolation construction methods as part of their efforts to offer earthquake resistant buildings. The Hybrid Taisei Shake Suspension System (TASS) combines Taisei's proprietary laminated rubber and sliding mechanism to significantly reduce seismic force. Laminated rubber is a powerful defense against pitching motions caused by earthquakes, and has the effect of lengthening seismic waves through buildings. The sliding mechanism absorbs horizontal seismic force in the form of friction energy in a sliding motion.

Seismic isolation technology developed by Taisei has been applied in high-rise buildings, as well. Taisei has won high praise for its development and implementation of this technology and was awarded a 2004 AIJ (Architectural Institute of Japan) Prize (Building Engineering Division) for its efforts.



With a total of 41 floors, and a height of 135 meters, this building is the largest residential complex (at time of completion) made of reinforced concrete and with a seismic isolation system. By using the hybrid TASS construction method Taisei is able to make safe yet luxurious and high quality skyscrapers complete with seismic isolation systems at comparatively low-costs.

*Thousand Tower: The entire Shin-kawasaki project has been named Thousand City, and building no. 1, the skyscraper, is called the Thousand Tower.



Natural rubber-based laminated rubber mechanism



Sliding mechanism



Steel dampers

Responding to Demands for High Earthquake and Fire Resistance and Excellent Durability

Ultra high strength Concrete-

TAISEI has developed the pre-blend binder for ultra high strength concretes, and has established the technology on production of ultra high-strength concrete with the specified design strength of 80-150MPa. It has been proved by the experiments that the structure members using these concretes have good earthquake resistance, good fire resistance, and good durability. Taisei has also developed a high-quality production management method for ultra high-strength concrete based on a method for swiftly measuring the unit water content of fresh concrete.

In Japan, this technology has been already applied to about ten high-rise buildings, and has obtained high satisfaction and high reliance of many customers. Based on such an actual result, this technology has won many technical awards in Japan Concrete Institute, the Architectural Institute of Japan, the



Tokyo Twin Parks, Tokyo., Japan

Society of Materials Science, Japan, etc.

Taisei has introduced the advanced concrete technology not only domestically but also internationally at venues such as the triennial International Symposium on Utilization of High-Strength/High-Performance Concrete, which has been held in the UK, Germany, and Norway.

Leading to Optimum Solutions

Building Pharmaceutical Plants that Meet the Latest Demands for Sophistication and Versatility

Pharmaceutical Plant Engineering

When the revised Pharmaceutical Affairs Law takes effect in April 2005, the focus of approvals will shift from manufacturing to sales, and it will become possible for companies to sell pharmaceuticals even if they do not own a manufacturing facility. Consequently, there is pressure to improve operational efficiency by, for example, spinning off plants or offering or using outsourced manufacturing services. And this in turn is driving demand for facilities that are more flexible than today's plants in terms of quality, cost, and products that can be turned out.

Taisei, in addition to providing construction proposals covering details such as air conditioning system designs that allow precise humidity control and site usage plans emphasizing future growth, brings together its 30-plus years of engineering experience in fields such as production, distribution, and information systems to build high-quality pharmaceutical manufacturing facilities that balance building and production functions in an efficient, rational manner.



Fujiyaku Co., Ltd.'s Toyama No. 2 Factory, Toyama Pref., Japan

Technological Strengths

At a Time When Facility Construction Applying the Latest Technologies is in Demand

Super Advanced Research Center for Flat Panel Display

Taisei created the construction plan for the Super Advanced Research Center for Flat Panel Display (SARF), the world's most advanced research facility for the development at a moderate cost manufacturing technologies for next-generation large-screen flat panel displays.

Construction of this facility had to be performed with high quality, on a short construction schedule, and at low cost. It, therefore, involved a broad range of engineering technologies spanning all project phases from planning to actual construction. These technologies also had to address all areas of research facility construction, including structures, building equipment, utilities for research equipment, and automation systems.

The building housing this research facility is a two-story reinforced concrete structure with a footprint of 5,600m² and total floor space of 9,800m². Within it, an extremely advanced research environment has been created to perform research and development on liquid crystal display manufacturing technologies radically different from those used to date. This environment thoroughly excludes chemical contaminants, micro vibrations, and other factors that can negatively impact research and manufacturing. Additionally, as an environmentally conscious facility, energy saving and recycling technologies have been adopted in SARF.



Super Advanced Research Center for Flat Panel Display (SARF)

Passing On A Rich Natural Environment to the Next Generation

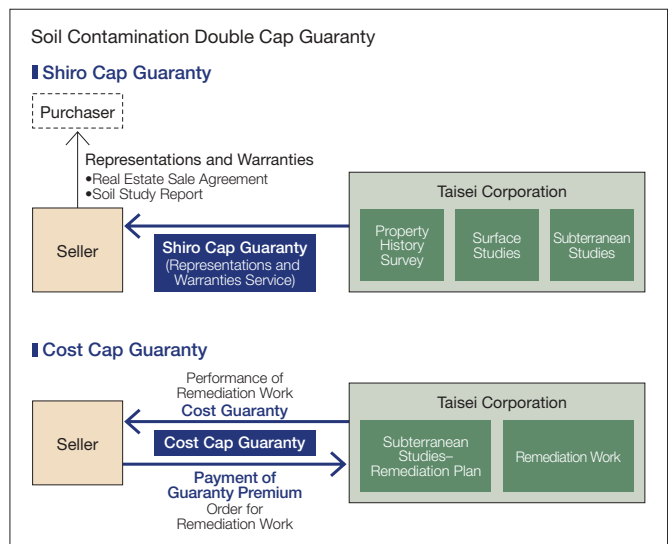
Answering the Growing Need for Risk Indemnification in Soil Remediation

Development of Guaranty Products for Soil Remediation

With rising environmental consciousness and the need to redevelop and effectively use land, Taisei is year by year adding to its list of achievements in soil remediation by developing soil remediation technologies, one example of which is a permeable wall that cleans groundwater.

For transactions involving former factory sites, new and growing needs to lower contamination risk and fix expenses for risk-reduction measures have been added to needs for lower remediation costs. In response, Taisei, working in cooperation with a non-life insurer, developed two liability cap guaranties. Under the Shiro Cap Guaranty, landowners can receive a guarantee that their property is not contaminated after an examination of its history, depth studies, and other tests are performed and show that to be the case. The Cost Cap Guaranty fixes remediation costs, covering additional costs even if additional contamination is discovered.

Taisei offers a full complement of both remediation technology and risk guaranties to promote more effective land usage now and in the future.



Meeting Needs for Environmental Conditions that Increase Biodiversity

Ecological Planning - The Noritake Garden Project

Responding to the need for greater biodiversity in the local environment, Taisei conducted an environmental revitalization project at Noritake Garden, located in the heart of Nagoya and deep within an urban setting.

As part of this project, Taisei examined the characteristics of the natural environment in urban Nagoya, especially the area surrounding the Noritake Garden site. Using the results of this study, we then created a landscape that would allow the formation of a natural network in which animals and insects could move among the various green spaces in the surrounding area. We also devoted significant effort to effectively using existing industrial assets and the waste resulting from demolition to create expressions of the history and unique aspects of the location.

The entire Noritake Garden site is open for use as a park during the day and is a favorite place to relax for local residents. The site received the Good Design Award 2003, the 2nd ecobuild Award, the 23rd Minister of Land, Infrastructure and Transport Prize Winners of Green City Awards and many other Awards.



Noritake Garden

Helping to Bring About a Recycling-Oriented Society

New Recycling Center PFI Project for Tahara City

Companies are now expected to reduce the environmental burden of their activities and great significance is now placed on the creation of a recycling-oriented society focused on reducing waste.

Taisei designed and built a recycling center for burnable waste coming from one city (Tahara) and one town (Atsumi) in Aichi Prefecture, and it is managing a BOT-format PFI project in which it will operate and maintain the recycling center, which it will retain for 15 years.

The recycling center is operated by an SPC (Special Purpose Company) established by Taisei and four other companies from different industries. Contributing to the creation of a recycling-oriented society, the SPC performed a study of the characteristics of the area to be served and has embarked upon a scheme in which burnable waste from households and businesses will be recycled into carbide that will be used as a fuel and raw material for the manufacture of steel. In addition to contributing to the creation of a recycling-oriented society, environmental conservation, reliability of technology implemented, economical construction and operation, and risk management have also been included as important initiatives in facilities and operational planning. In the future, Taisei will offer other regions new proposals aimed at creating a recycling-oriented society.

*BOT (Build, Operate, Transfer): Construction method in which a facility is transferred after being operated for a certain period of time after construction.

*PFI (Private Finance Initiative): Projects for pursuing the construction, renovation, etc. of public facilities with capital and other inputs from private sources.



New Recycling Center, Aich Pref., Japan

Technological Strengths

In an age of the need for preventing global warming

Technology of producing fuel grade ethanol

Construction industry in Japan is trying to reduce and recycle construction and demolition wastes that account for 20% of all industry wastes because the greenhouse gas emissions are needed to be reduced throughout all over the world.

Taisei Corporation is planning to produce fuel grade ethanol that can contribute to reducing CO₂ emissions and could be an alternative energy resource to petroleum oil using waste woods from construction debris.

Taisei Corporation has established the company to produce fuel grade ethanol from construction waste woods as the largest stockholder of the one and this company is expected to diffuse the use of ethanol-blended gas and tackle the tasks of developing global warming countermeasure technology.



Bringing Back Beautiful Marine Environments with Appropriate Analysis and Clean-Up

Coastal Clean-Up Technology

In coastal areas where water quality continues to worsen, tidal flats are being revived to help restore the ocean's ability to clean itself. Taisei is engaged in just such an experiment in Mie Prefecture's Ago Bay, famous for cultured pearls. There, it is using sludge dredged from the ocean floor to make artificial tidal flats and creating marine environments to foster the growth of eel grass. Taisei is also performing exhaustive studies of the tides and water quality in the inner bay, which is suffering from worsening water quality, and developing an "Aquatic Simulation System" to produce high-precision forecasts of changes in seawater and marine ecosystems. Taisei is working from the perspectives of both cleaning technology and analytical methods to achieve its goal of restoring and improving aquatic environments.



Ago Bay, Mie Pref., Japan

Environmental Preservation Activities

Healthcare and Specialty Products



Taisei helps to protect the environment by applying technologies it has developed through its principal construction and civil engineering operations. As a leading company in Japan's construction industry, it also promotes research and development of environmental technologies and works to create or restore sustainable environments, such as ones in which municipal facilities and infrastructure coexist with nature.

Taisei acquired ISO14001 certification for all 12 of its domestic branches and its Engineering and Architectural Divisions by the end of 1999. In fiscal 2004, it will bring all certified branches, the international branch, which has not to be certified but is implementing EMS activities, the Housing Division, and headquarters under a fully integrated environmental management system, and then acquire a single ISO14001 certification for the integrated whole in October 2004. The purpose of this step is to increase work efficiency and achieve greater performance.

Taisei is developing a business aimed at creating or restoring sustainable environments by applying its technology and know-how to respond to ever-greater environmental needs. Targeting the new business areas of urban redevelopment, environmental engineering and renewal, Taisei has achieved results not only in Japan but also overseas, as well. Taisei announces the Taisei Agenda, consisting of environmental targets and action plans, in April of each year and actively pursues environmental preservation activities. It discloses what it has accomplished through these activities in terms of environmental impact reductions, environmental accounting results and other concrete measures in the Taisei Annual Environmental and Social Report.



Taisei leads the industry in environmental preservation activities and enjoys strong evaluations in overseas company evaluation indices.

Taisei's Principal Environmental Technologies

■ Environmental preservation and creation technologies

- Environmental assessment
- Regional environmental creation
- Ecosystem preservation
- Ecosystem remediation

■ Soil and groundwater purification technologies

■ Wastewater treatment technologies

- Industrial wastewater treatment
- Residential wastewater treatment
- Effective water usage

■ Recycling technologies

- Material recycling
- Thermal recycling

■ Waste treatment & disposal technologies

- Sorting & Transfer Facility Planning
- Sorting & relay-facilities planning
- Medical waste
- Incinerators
- Landfills

■ Energy technologies

- New energy
- Energy efficiency