SATO KOGYO CO.,LTD.

DNP 19.06.2000

SATO KOGYO

TOTAL PROJECT EXCELLENCE

SATO KOGYO Co., Ltd.

COMPANY BROCHURE

SATO KOGYO Co., Ltd. Corporate Philosophy

To establish a corporate image trusted by the society
To promote management with energetic human resources with a philosophy of mutual respect
To fulfil our corporate mission and contribute to the development of the society

Building

Building is about creating “spaces” that make living safe and comfortable.
The basics for construction are that spaces are beautiful, efficient and usable for many years to come.
At SATO KOGYO Co., Ltd., we always return to these basics, while exploring and developing techniques, and carry out construction of a variety of uses with sincerity.

Civil Engineering

Civil Engineering is the building of a social infrastructure that supports industries and people's lifestyles.
The basics for civil engineering are to produce efficient, durable infrastructures which take the environment and the economy into consideration.
At SATO KOGYO Co., Ltd., a lot of know-hows are reflected in our construction plan-from the fundamental research of the materials we use to the overall structural efficiency and appearance of the projects.

Environment

Environmental affairs involve considering the future of our earth, fulfilling responsibilities for conservation, and establishing proper waste management practices.
The basics for the environment are to strive for a symbiosis between man and nature.
At SATO KOGYO Co., Ltd., we propose and support people's lifestyles to be at their optimum level.

Overseas

Our advanced Japanese construction technologies are well-appraised overseas and we have many achievements to attest them.
The basics of our overseas work is to respect the culture of each country and to execute high quality construction to meet our customers' needs.
SATO KOGYO Co., Ltd. currently has several large projects under construction in different parts of the world.

We at Sato Kogyo highly appreciate your generous patronage and support, without which we could not have achieved our success as a general contractor since our firm's establishment in 1862 at the dawn of modern Japan.

Expounding on Sato Kogyo's guiding corporate philosophy of 'Total Project Excellence', we have strived in years past to enhance customer satisfaction, build safe, secure and comfortable spaces and develop high-quality social infrastructure. Going forward, we remain dedicated to placing our customers' interests first, responding to society's needs, maintaining excellence and being a good partner to high-tech service organizations.

We look forward to your continued support in the years ahead.

Masafumi Miyamoto, President, Representative Director

Founder Sukekuro Sato
Completion of Jinzu bridge(1882)
Aimoto bridge(1890)
Former Kanazawa Univ.(1890)
Jyoganji river improvement works (1892)
Sasatsu bridge(1892)
Hokuriku line Shogawa Train-bridge (1895)
Hokuriku line Yamanaka tunnel opening ceremony(1896)
Shogawa river wall protection works (1900)

Locomotive of San-in Yonago line (1901)
Chuo line Nakatsugawa river works (1904)
Completion of Shinkawa bridge (1904)
Oyabe Train-bridge(1908)
Japan Red Cross Toyama branch hospital(1909)
Toyama Electric power Ioridani power station(1918)
Atami line Section No.3 Komekami bridge pier(1921)
Daido Electric Power Momoyama power station(1923)
Kanidera water power station(1925)

Komaki dam(1928)
Sukekuro II site visit to the Toyama prefecture's Magawa power station construction(1929)
Nishi Honganji Tokyo Tsukiji temple Betsuin (1934)
Nagano station(1936)
Hokuriku Bank(1948)
Teito Rapid Transit Authority Ikebukuro-Kanda Suido-cho section civil engineering(1952)
Construction of Jinzugawa river No.1 water power station(1953)
Kurobegawa river No.4 power station construction(1957)
Asakusa Shinsekai building(1959)

Hokuriku tunnel(1961)
Miboro power station(1961)
Prime Minister's and Government office building(1963)
Imperial Household Agency Hospital(1964)
Matsukawa geothermal generating plant (1966)
Hokkaido Economic Center(1966)
Toei Subway No.6 Line Hakusan Section(1972)
West Nagoya thermal power station (1972)

Japan's digging record of 62.18m/day for the Tohoku Shinkansen No.2 Arikabe Tunneling work(1973)
Joetsu Shinkansen Daishimizu tunnel(Sennokura) (1977)
The world's largest TBM(Tunnel Boring Machine) used in Tohoku Shinkansen No.2 Ueno tunnel(1980)
Tobu Zoo/Amusement Park(1981)
Kamakura station(1984)
Shinjuku Green Tower building(1986)
Seikan Tunnel Horonai Section (1987)
Renaissance Resort Okinawa(1988)

Hokuriku Electric Power HQ building (1989)
Georgian Terrace redevelopment (1991)
Gate Tower building(1992)
Toyama city office(1992)
Skill training center dome(1992)
Rhythm City (1993)
Momosukebashi bridge renovation(1993)
Ath Nishi Waseda (1993)
Intec Meiji Life Insurance building "Tower 111"(1994)

Edogawa waste incineration plant (1994)
Safti Link bridge(1996)
Hokuriku Shinkansen Gorigamine tunnel(1997)
Nursing home "Kurara Totsuka"(2000)
Raffl'es hospital(2002)
WATERLINE(2006)
Tanikawauchi dam (2011)
Victoria Theatre & Concert Hall (2014)

With the time, With society, We keep moving forward.

SATO KOGYO Co., Ltd. has its roots in Sato-Gumi and was founded by the founder: Sukekuro Sato in Yanase, Toyama in 1862 and since then, we have been active and moving forward with our country.

Our first task during early period of Japan's industrial development was the flood prevention work for the rivers which had often overflowed their banks and troubled people in our hometown Toyama.

Since then, we have contributed to the establishment of the social infrastructure through various construction projects not only in Japan but also in foreign countries, and mainly in Southeast Asia.

Our aim is to protect people's quality of life and place the top priority on our customers' satisfaction.

It is our pleasure to achieve such a contribution as a group of technicians. We will keep moving forward with the time and with society.

Jyoganji River improvement works in 1892

Building Works

Sato Kogyo has constructed many types of building in the world successfully. Such buildings include educational, cultural, entertainment, commercial retail, office, residential, healthcare, research & development, religious, manufacturing, cleanroom, pharmaceutical, semiconductor, aerospace, food & beverage and data centre facilities. Irrespective of the types of building, the fundamental purpose of any building is to be a “Vessel for People”. Hence, buildings must be able to sustain the lifestyle, culture and characteristics of the occupants. Sato Kogyo's philosophy is to always strive for excellence in design and construction, to fulfil the aspirations of the clients and building users as well as to care for the buildings by maintaining them in the best possible conditions throughout their lives.


Photo:Hiroyuki Hirai

Mt.FUJI WORLD HERITAGE CENTRE, SHIZUOKA（Shizuoka Prefecture）

PMO Nihonbashi edo-dori（Tokyo Metropolitan）


Imizu city hall（Toyama Prefecture）


TOA ROAD CORPORATION Headquarter Building（Tokyo Metropolitan）


Hatsukaichi energy clean center（Hiroshima Prefecture）


SHOWA NOTE Takaoka Plant（Toyama Prefecture）


Hakodate Arena（Hokkaido Prefecture）

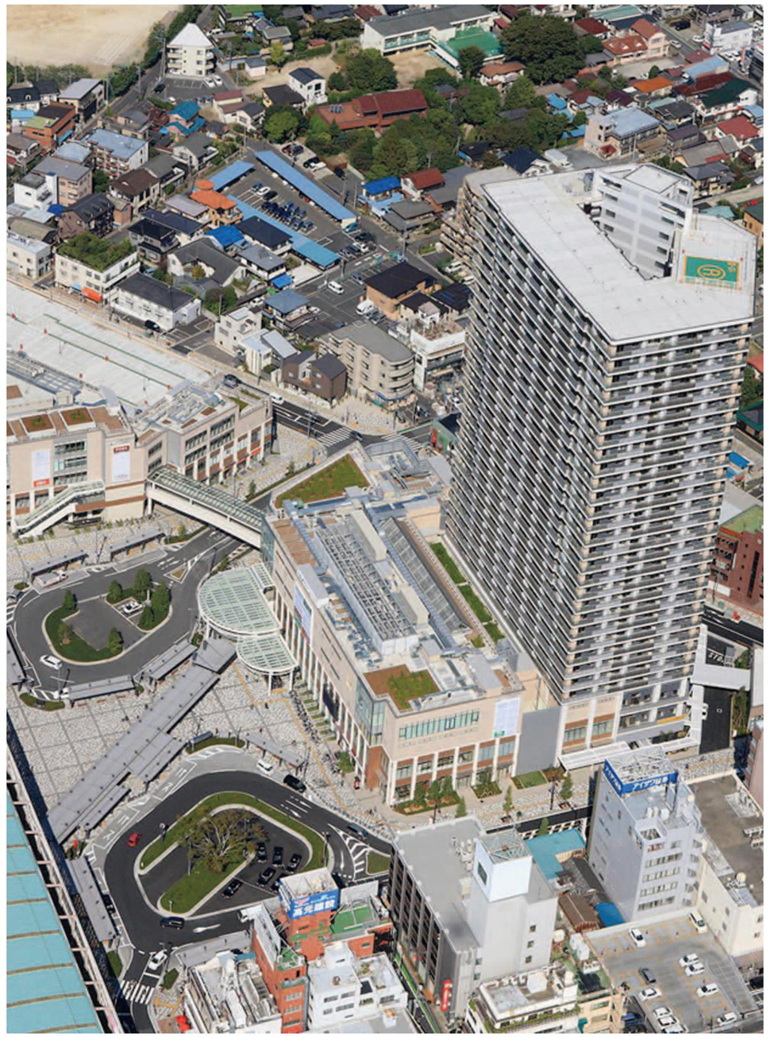
Xebio Arena Sendai（Miyagi Prefecture）


National Cancer Center Hospital（Tokyo Metropolitan）


Aichi Children's Health and Medical Center emergency section（Aichi Prefecture）


Minamisoma Municipal General Hospital Stroke Center（Fukushima Prefecture）

Building Works



Koshigaya Twin City（Saitama Prefecture）

Tokyo Institute of Technology Earth-Life Science Institute-1
（Tokyo Metropolitan）

Tohoku University Building of Civil Engineering and Architecture（Miyagi Prefecture）

SHARE STAR HAKODATE, PREMIST TOWER HAKODATE GORYOKAKU（Hokkaido Prefecture）

Royal Parks Tower Minamisenju
（Tokyo Metropolitan）

The University of Tokyo Kavli Institute for the Physics and Mathematics of the Universe
（Chiba Prefecture）

GLP SayamahidakaⅡ（Saitama Prefecture）

Hokuriku Shinkansen Shintakaoka Station（Toyama Prefecture）

Hilton TOKYO ODAIBA（Tokyo Metropolitan）

GRANDVRIO RESORT ISHIGAKIJIMA Villa Garden（Okinawa Prefecture）

NISSAN STADIUM（Kanagawa Prefecture）

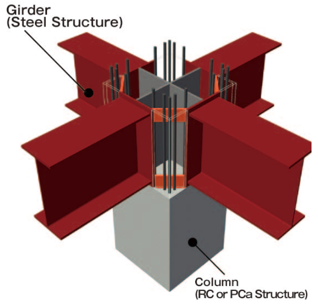
Toyama Central Police Station（Toyama Prefecture）

Technology for Building

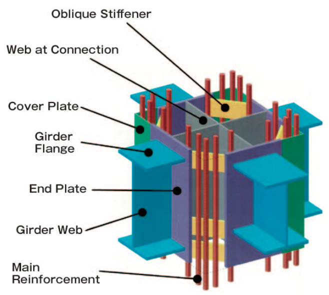
Now is the time to abandon the myth of "Build and Scrap" and to construct quality buildings that can last for more than 100 years. The life of buildings are not only physically durable but are also flexible in layout to accommodate the changing needs and expectations of different era. Sato Kogyo's objective is to provide quality living space with due consideration for the environment. We have the technology and expertise to design and construct quality buildings by tapping on our more than 150 years of experience throughout the value chain: from the inception and planning stage of the projects through their construction stage and to the completed buildings' long-term maintenance programme.

RC Column-steel girder hybrid structure system "SHOPS Method (Satokogyo Hybrid OPtimum-Structure)"

The aim of this method is to integrate a reinforced concrete column of high rigidity and high compression strength and steel girders of light weight and high bending strength by a unique connection system. Concrete of Fc=21 to 60 (N/mm^2) and reinforcing bar of SD295 to SD490 can be used for the RC column. This method is effective for buildings having high floor height and wide column space, such as distribution center, other than applications for shopping center / office building. Precast members also can be applied for the columns.



Overview of Connections of Girders and Column

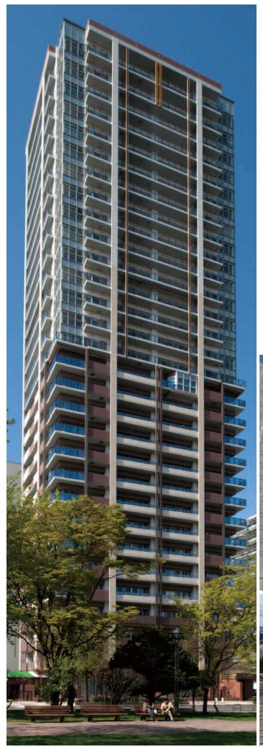


Names of Parts


Installation Condition of Steel Girders

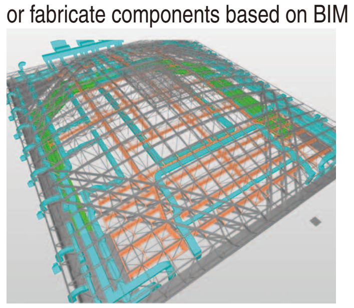
SHRC SYSTEM

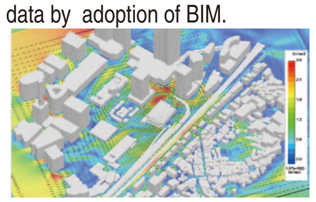
SHRC SYSTEM is the RC highrise residential building system which make use of the characteristics of RC structure such as stability against wind blow and low construction cost. The main structure frame like columns and beams are conventional RC structure (Only the balcony may is precast concrete), however, this system enable to shorten the construction time by utilization of high strength material and rationalization of construction method.



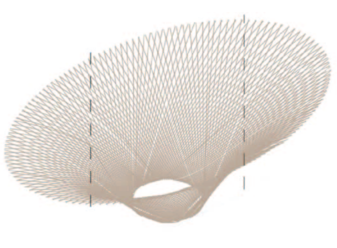
Adoption of BIM

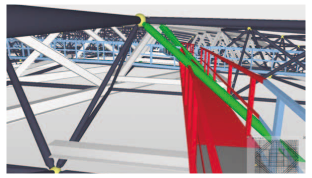
During design and construction stages, it is possible to handle three dimensional complicated shape, check interference among building elements, design consensus by VR, simulate actual construction process or fabricate components based on BIM data by adoption of BIM.


Detailed design of the 3D shape


Wind environment simulation

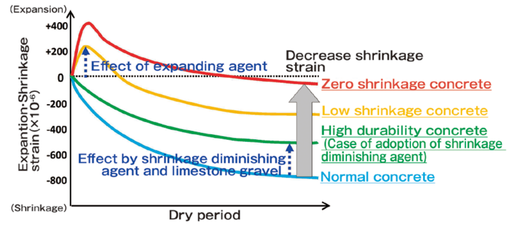

Design Consensus by VR


Part production from BIM data


Interference check

The method of control drying shrinkage

Shrinkage crack caused by drying of concrete affect durability and aesthetics of building. This technique was developed by cooperative research together with Hazama Ando Corporation, Kumagai Gumi, Toda Corporation, Nishimatsu Construction, Fujita Corporation and Maeda Corporation. In the course of development of this technique, it was verified how to control the concrete drying shrinkage from normal range to zero by full-scale specimen. This technique enable provide high value to the concrete by maintaining quality and aesthetics in long term.

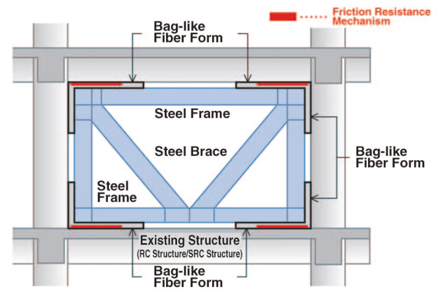


Conceptual view of drying shrinkage strain controlled

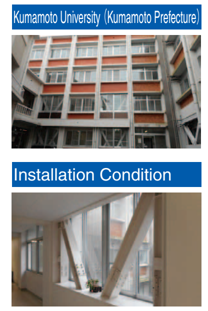

Full scale specimen

Simple grout connection using fiber form

It is a method of Strengthening integrated earthquake resist using Steel Brace frame of RC Structure, SRC structure by bag-like fiber form. This can reduce cost, noise and vibration, and also shorten construction time because [Post-installed Anchor] is not necessary. Moreover, able to use the building even when the building is on construction.



Overview figure of E-Brace



ADOPTION EXAMPLE

Active noise control system

This is the noise reduction system by active noise control theory, which is the silencing method by generating over the opposite phase noise against undesired noise. Since noise generated by construction machine is lower range, it is difficult to reduce by conventional silencer, however, this system is able to reduce such noise efficiently in spite of its compact shape. This system was developed by cooperative research together with INC engineering.

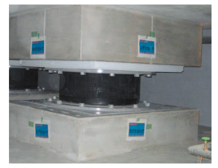

System operation status

Base isolation retrofit method

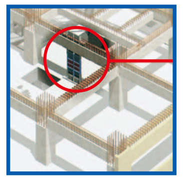
Able to improve the seismic performance function of old building from the introduce of seismic isolation equipment on the existing building. Able to use the building even when the construction is being carried out.


After temporary support, cut wire-saw of existing pillar


Base Isolation Installation

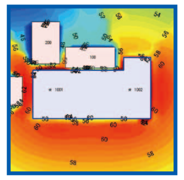

Change Axial force complete

The typical possessive technology



SHRC possessing structural control system

Column type vibration damper using low yielding stress steel absorbs the seismic force and protects the building. Application of damage control design which considers absorption of seismic force enables to reduce column and girder sections and save construction cost.

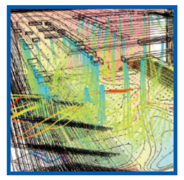


Sato Kogyo Noise Assessment Program

Assess the noise from nearby environment, or noise from equipment on construction site, factory, or any shop. The result will be shown in graphical diagram, such as sound pressure level diagram, and also can analyze the efficient extraction of the sound source, and necessary measurements.

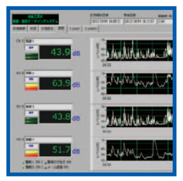
Demolition method of super high chimney

It is the way to demolish super high steel chimney, like drop from base. Up to now there were many problems such as high cost for large crane, dangerous work on high place or even the workpiece flying away, but this problem is already improved, that the height for working place is less than 30m from ground.



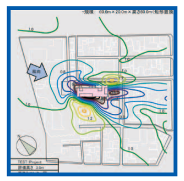
Computational fluid dynamics simulation

This is the technique to forecast air flow, temperature or distribution of contaminant particle by computer simulation linked with BIM. It is able to correspond various issues such as setting out of air-condition machines, travel distance of air flow or outdoor density diffusion.



Noise and vibration monitoring system for construction site

This is a real time data measurement and display system for noise and vibration at construction site and it records compliance with specified limit values to minimize environment influence.



Sato Kogyo Wind Environmental Assessment System

This is the system to assess wind environment at building surrounding. It is able to estimate wind environment accurately by utilizing huge data base collected by various wind tunnel test. This system is able to reduce the time and cost for analysis and to be utilized from planning to construction stage.

Civil Engineering Works

We, Sato Kogyo, have been serving the society in a wide range of infra-structure projects related to energy, roads and rails, dams, sanitation, land fill and marine. In the designing and construction of civil engineering structures, we always emphasize on function, durability, environment and aesthetic. We are able to achieve the desired quality and result because of our years of experience and our continuing research in methodology.

Road and railway


Hokuriku Shinkansen, Shinkurehayama Tunnel（Toyama Prefecture）


Tokyo Metro Namboku line, Minamiazabu Section（Tokyo Metropolitan）

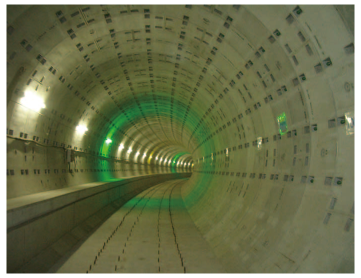

Kinki Expressway Ikasaka Tunnel（Wakayama Prefecture）


Tokyo Metro Hanzomon line, Honjo Section（Tokyo Metropolitan）


Sanriku-engan Road Kesennuma Tunnel No.2（Miyagi Prefecture）

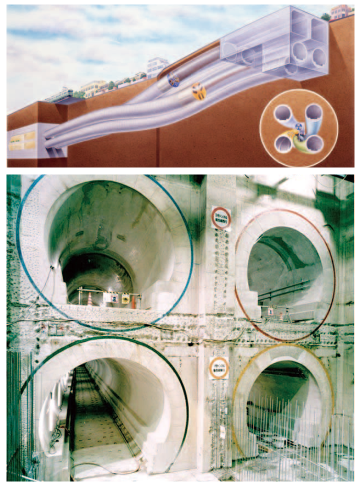

Hokuriku Shinkansen, Shintakaoka Station Viaduct（Toyama Prefecture）


Tokyo Metro Fukutoshin line, Shinjuku Sanchome Station（Tokyo Metropolitan）


Sendai Municipal Subway Tozai Line Shindera Section（Miyagi Prefecture）


Toyama City Tram Line Toyama Station North-South connection（Toyama Prefecture）


Tokaido line, Reconstruction work for Fudanotsuji overbridge between Tamachi and Shinagawa（Tokyo Metropolitan）


Kyoto Municipal Subway, Tozai line Misasagi-higashi Section（Kyoto Prefecture）

Energy+Industry


Isogo Thermal Power Station, Coal Silo（Kanagawa Prefecture）


Okutadami Power Station, Tailrace（Fukushima Prefecture）


Kakkonda Geothermal Power Station（Iwate Prefecture）


Tohoku Electric Power, Noshiro Thermal Power Station（Akita Prefecture）


Otaki Solar Power Station（Chiba Prefecture）


The Kansai Electric Power, Pipeline nearby Nishi Umeda（Osaka Prefecture）

Civil Engineering Works

Dam


Tomata Dam（Okayama Prefecture）


Tanikawauchi Dam（Kagoshima Prefecture）

River and water works, sewerage


Surge Tank for Metropolitan Area Outer Underground Discharge Channel（Saitama Prefecture）


Toyama City Matsukawa Rainwater Storage Tunnel（Toyama Prefecture）


Seibu Sewage Treatment plant（Hyogo Prefecture）


Niwakubo Water Treatment Plant（Osaka Prefecture）


Asaka Water Gate（Saitama Prefecture）

Bridge


Shinkoganezawa Bridge（Yamanashi Prefecture）


Himinoe Bridge（Toyama Prefecture）

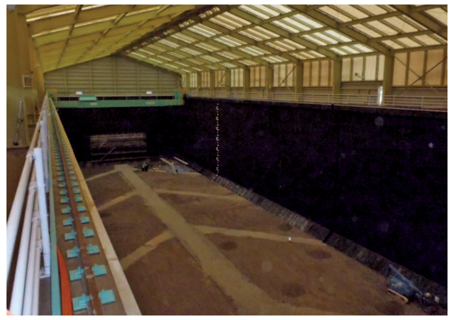

Keinawa Expressway Kihokunishi Road Wakayama Junction（Wakayama Prefecture）


Akashikaikyo Bridge（Hyogo Prefecture）

Grading and landfill


Shichigahama High ground Residential Estate（Miyagi Prefecture）


Kasugai City Utsukitayama Final Disposal Site（Aichi Prefecture）


Miyazawa Clean Center New Final Disposal Site（Toyama Prefecture）

Marine


Kansai International Airport, Phase 2 Reclaimed Land（Osaka Prefecture）


Chubu International Airport, Dike Construction（Aichi Prefecture）

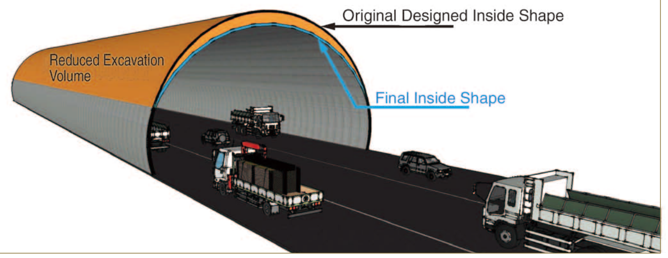
Technology for Civil Engineering

Civil Engineering involves a wide range of technology in various desciplines. New technology taking account of environment and landscape has been developed for construction in order to increase capability of structure. Improvement of technology also has been done to increase efficiency of work towards “Work Style Reform”.

Construction Technology for Tunnel considering economical and environmental aspects

Design and construction of super-large section tunnel with an inner section aspect ratio of 0.52

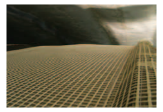
Kesennuma Tunnel No.2 is one of the largest cross section tunnel in Japan as per its entrance of Iwate Pref. side has 3 traffic lane because of ramp. In the original design, this tunnel’s inner section aspect ratio γ (= Inner height / Inner width) was 0.57 as commonly applied. However, if the tunnel cross section area could be reduced, it leads to reduce not only the excavation volume and temporary support work, but also maintenance work in future. Therefore, we proposed to reduce the inner section aspect ratio and we put this design into execution.The ratio value γ shall be finally decided to 0.52 by analysis of temporary support, lining and invert. By this engineering design, tunnel cross section area shall be reduced to 189m² from original design 202m². Cutting area for tunnel entrance could be also reduced. Our design and construction contributed to not only the reduction of construction and maintenance cost, but also landscape protection and environmental loading reduction by reduction of carbon dioxide due to construction and reduction of forest cutting area.



T-FREG (Tunnel Fiber Reinforced Edging) method

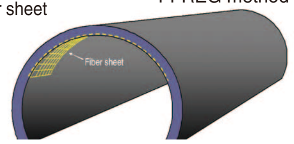
Technology for prevention of exfoliation and cracking of tunnel concrete lining

This is a technology to provide crack reduction effect and exfoliation preventive effect to the tunnel lining surface by fixing netlike fiber sheet, which will be integrated with lining concrete, to the surface part. It can provide safety and security to both the administrator and the user and it is effective for prevention of traffic disaster due to exfoliation of lining concrete, mitigation in maintenance cost for urgent repair works etc. and prevention of economic loss due to detouring.



Laying of fiber sheet

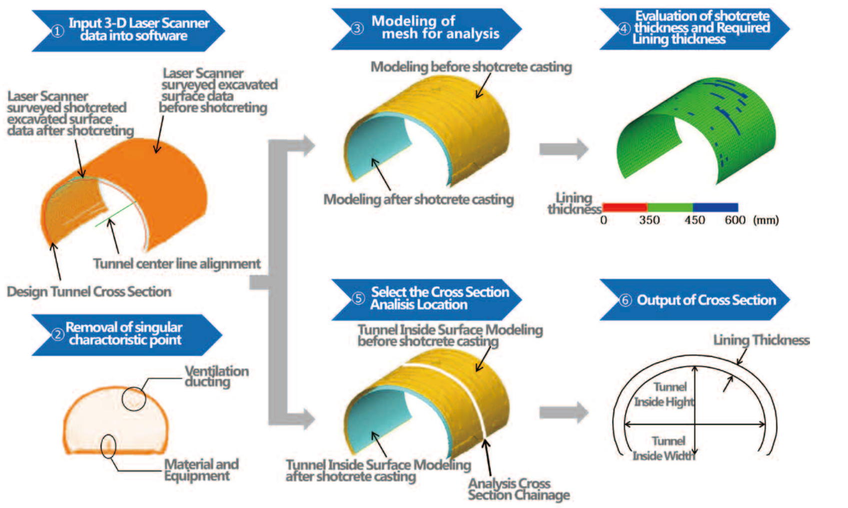
Image figure of T-FREG method



Build Meister･tunnel package

Tunnel form management by laser scanner

Build Meister™ is the work progress control software which can find out the best solution for the concrete lining work.This software advises practical solution for the thickness of concrete lining by the accurate analysis of as built shotcreted surface and excavated surface detailed condition.And input 3-D Laser scanner surveyed information of the actual shotcreted surface before starting excavation work shall be displayed or output for understanding the shotcreted and excavated surface condition easier. These procedure by using this software is able to achieve approximately 80% of time saving compare with the former concrete lining construction procedure.



The typical possessive technology

Total blast system

The construction to excavation blast method at mountain tunnel becomes safer and faster due to the process development（Drilling, Marking,Expert, and Charging）of the entire system which is automation and laborsaving. It is also applicable to a large section road tunnel and underground power generator plant.

Rapid construction system in small section TBM

This TBM auto spray is the first system of the world that can perform excavation and lining simultaneously.

Enlargement of live line tunneling method

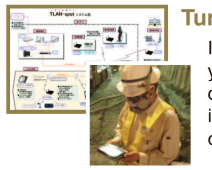
For tunnel in widening construction, this method is applicable to wide ranges of geological substances from hard rock to soft rock, and uses moveable blast protector. It is possible to shorten construction period and to reduce construction cost while ensuring safe passage of other vehicles.

Dust collector integrated catenary bogie

For the construction of tunnel, continueous belt conveyor system for hauling the excavated material is the most popular method. However for the belt conveyor system requires the sufficient area for the excavation machine equipment arrangement. Therefore for the middle sized cross section tunnel the belt conveyor system was not adopted due to its insufficient space for site work .This excavation- dust collector combined bogie track requires only smaller area, so that this bogie track shall be expected to increase the belt conveyor type hauling method for the middle sized cross section tunnel construction.

Tunnel JUDGment system of demolding time on site

This is a system to decide demolding time according to the variation of curing conditions by using a strength-estimation equation previously established from the monitoring strength development data of tunnel lining concrete based on the cumulative temperature of concrete and so on.



Tunneling local area network system

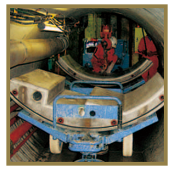
It is a technology that considers Tunnel construction yard as a part of network area, stabilizes the signal condition of control data rapidly, and able to retrieve input-output data in any work areas, either underground or outside the pit.

No grouting excavation for shield on launch and reach system

For departure and arrival of shield construction, it is a method of shield departure and arrival that can develop land at lower limit. This will install the manufactured gate at the open position of shield launch and reach until the designated position under the water with the first step of Caisson method such as urban ring.

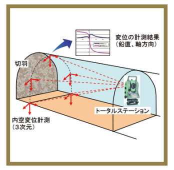
Segment position retaining system【TKS】

This is a device to support the segment ring from the outer peripheral side immediately after assembling segments by expanding inflatable bags installed in the shield tail by using compressed air. It retains the segment position and enables to transfer the driving force of the shield machine to rear segments at the side of the natural ground in an unstable condition during assembling the segments in the shield tail.



Compact shield tunneling

Reinforcing integrated segment, which is attached 3/4 slot hinge, is applied to this shield method. According to wheel transport system with invert gutter guide, rail facilities（such as rail, railroad tie, etc.）will be unnecessary.（Developed under the corporation of Tokyo underwater road）



Tunnel face forward geotechnical prediction system by inverse analysis using displacement measurements

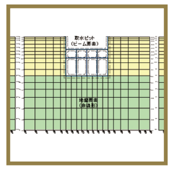
This is a system to predict the geological state of unexcavated part less than 10m away from the tunnel working face by inverse analysis based on data of axial displacement and vertical displacement obtained by measurement of tunnel convergence on a routine basis.

Horizontal PC-block for dam inspection gallery

Installation desk, concrete placement including special construction techniques that are different from PC-block inspection gallery is unnecessary. Safety and construction is improved. This can save Construction time and cost due to less manpower.

Simple mixture technology of local exhausted material

Mix local exhausted material such as riverbed sand or excavated soil together with cement and water in order to make material for structure. Moreover, CSG small mixture is completely mixed type, and applicable to a wide range of purposes.

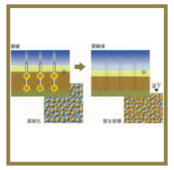


A seismic design and reinforcement for power plant facilities

From our skillful experiences on design and seismic back-check（Investigation guideline on Seismic design）for application of approval for nuclear-power plant construction, the operation of design, earthquake resistant diagnosis, and reinforcement inspection from non-linear earthquake response analysis and liquefaction flow analysis of water intake, drainage and tank of firepower（heating power）, nuclear-power plant will be implemented.

Installation method of long size reinforcing anchor bars by water jet drilling

This is a method to drill insert holes for reinforcing anchor bars by ejecting high pressure water supplied by high water pressure machine through water jet drilling machine without damaging existing reinforcing bars.



Measure against soil liquefaction by controlled blasting

This is a method that causes artificial liquefaction phenomenon by controlled blasting in loose sandy soil under ground water level to compact the ground in extremely short time and increase the strength by making the soil particles denser in process of dissipation of increased water pressure.

Anti-seismic reinforcement for masonry retaining walls in narrow space

By the employing of the Newly developed movable uplift platform, micro drilling equipment and precast cover plate, allow the implementation of the antisasmic reinforcement work in train running daytime even though the clearance between Train and work location at existing wall is narrow.

Portable hit sound diagnostic device by AI

This is newly fixed additional AI analysis device to Sato Kogyo’s Concrete Condition Assessment equipment “Portable hit sound diagfnostic device” ,and be able to performe the high level analysis(high clustering performance) of concrete .This High level devise is able to analyse the other various fauction of construction data.

Exfoliation risk evaluation technology for concrete structure surface using non contact acoustic imaging method

This is a technology to investigate the lift and separation of the surface part of concrete structure by remotely measuring and analyzing vibrational distribution on the concrete surface generated from Long Range Acoustic Device（LRAD）by utilizing Scanning Laser Doppler Vibrometer（SLDV）.

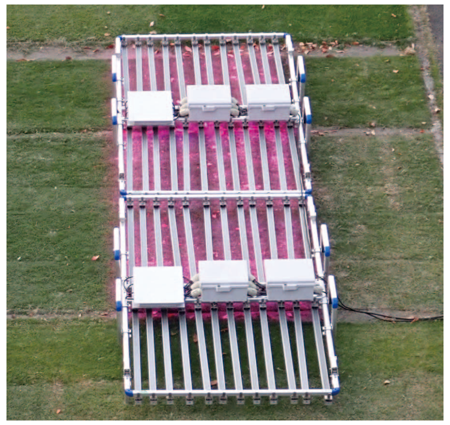
Environmental Business

The corner stones in our effort to address environmental issues are “Use power of Nature”, “View Waste as Resource” and “Revisit Ancient Wisdom”. We at Sato Kogyo combine these corner stones with the state-of-the-art technologies to foster environmental technologies for a society where people can live comfortably and securely. Sato Kogyo has completed many environmental systems with these reliable technologies.

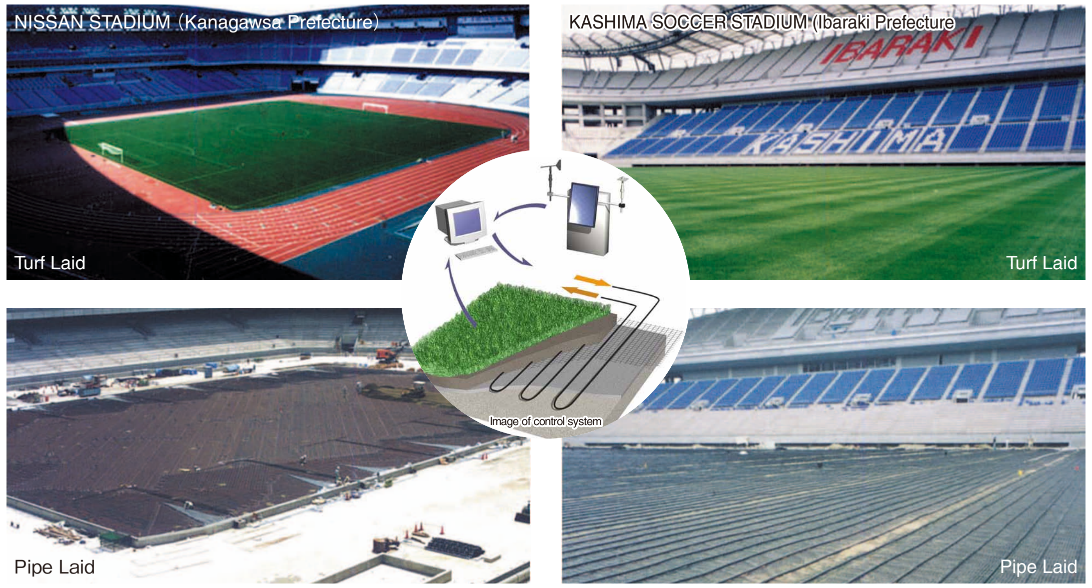
Measures for the environmental safeguard

Optimum heating control system for turf ground [SOLCON]

This is an automatic ground temperature control system which manages the proper temperature for growing turf grasses by means of hot/cold water passing through underground pipes so as to heat or cool the ground. The computer controls water communication by managing the weather information from sensors and the sunshine conditions that differ depending on sites of the field due to the stadium roof. It also takes into consideration the soil property that the ground is not warmed up quickly after it is heated. Following its introduction in Nissan Stadium, Kashima Soccer Stadium, and Ajinomoto Stadium, this system was introduced in Noevir Stadium Kobe in March 2018.
We are also conducting research on turf growth in combination use of a supplemental lighting system using light-emitting diode (LED), which is to be expected in the future.Experiment on turf growth in combination use of LED irradiation.

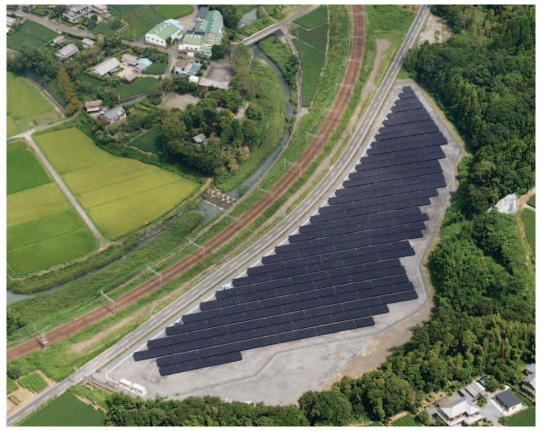


Experiment on turf growth in combination use of LED irradiation



Solar power generation system

Utilization for solar power generation of unused lands and/or properties not fully exploited has received a lot of attention as a new investment, since it can not only contribute to anti-global warming measures but also secure stable profits. At Sato Kogyo, as our own business, we started operation of a mega solar power plant of 1.4MW in Kikugawa City, Shizuoka Prefecture in Sep. 2013. Based on the knowhow of this business, we, as an EPC contractor, have offered optimum proposals on solar power system for the stages from planning to maintenance operation support and have so far received orders for 7 solar power stations. From Mar. 2015, we started operation of all-quantity buyback type solar power system installed with a low voltage rooftop at the laboratory building of our technical research institute. The power system is used to collect weather and electricity-generation data.



Kurasawa Mega Solar Power Plant in Kikugawa City

Volume reduction system of radioactively contaminated soil by classified-washing

This system applies the classified-washing technology for a heavy-metal contaminated soil to a radioactively contaminated soil. Clay minerals in soil with a small particle diameter are known to adsorb heavy metals strongly. This system can separate a clay fraction from gravel by washing the contaminated soil and can classify soil by particle diameter into the clay portion in which radioactive substances are concentrated and the relatively clean gravel, thereby can reduce volume of the contaminated soil.In the road sweeping and soil disposal work consigned by Fukushima Prefecture in 2015, we were able to pave the way for disposing contaminated soil safely on the designated waste scheme by the classified-washing treatment. This project received the Environment Award of the Japan Society of Civil Engineers as an environmental conservation project jointly addressed by industry, government, and academia with the understanding of local residents being secured.We will continue developing this technology for the use of volume reduction of the temporary stored contaminated soil, thereby to contribute to reconstruction of the affected area.

Classified-washing and volume reduction plant (Fukushima Prefecture)

Measures for the recycling-based society

Conversion system of sewage sludge into solid fuel

The conversion system of sewage sludge into soil fuel “SA-RPF method” is a technology to produce a new fuel by mixing and solidifying fermented and dried sewage sludge and waste plastics. It has a feature of reducing greenhouse gas emissions due to natural drying of sewage sludge using aerobic-fermentation instead of fossil fuels in conventional technologies such as incineration. This technology has acquired a construction technology examination certificate of Japan Institute of Wastewater Engineering and Technology issued in 2012 fiscal year.

Fermented and dried material

Solid fuel (SA-RPF)

SA-RPF : Abbreviation of Sewage-sludge Aerobic-fermentation Refuse Plastic & paper Fuel

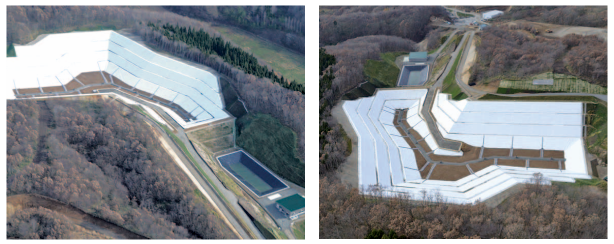
Waste disposal

Landfill

Regarding the wastes, the proper final disposal is required along with promotion of recycling. Sato Kogyo has participated in management of a company established jointly with Kakuyama Kaihatsu Co., Ltd. of Hokusei Group based in Sapporo City to operate the first in the region controlled and least-controlled landfill sites in Esashi-cho, Hiyama-gun, Hokkaido. We will gain experience in project operations on top of our technologies developed in our past construction works.

Restoration of illegal waste dumping site / Disaster waste management

In treating the wastes, it is important to perform optimization through securing of the waste disposal route, selection and installation of the treatment method and facilities suited to the properties of the waste, environmental conservation measures during the work, coordination with concerned organizations and so on, in consideration of the circumstances of the surrounding areas for each project. At Sato Kogyo, based on our experiences and know-how through our illegal waste disposal dumping restoration projects and disaster waste disposal projects, we can offer proper and efficient solution plans.



Esashi Industrial Waste Final Disposal Site (Hokkaido Prefecture)

Restoration of illegal waste disposal site (where highly-concentrated hydrogen sulfide gas was generated) (Chiba Prefecture)

Disaster waste management after the Grate East Japan Earthquake (Miyagi Prefecture)

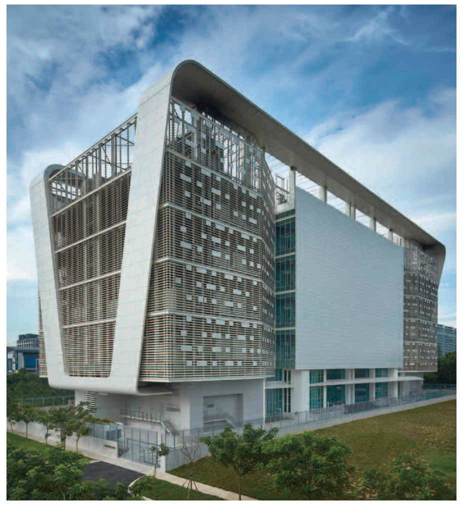
Overseas Business

Sato Kogyo has been very active in overseas market, particularly in South East Asia since the early 1970s. The Company has successfully completed numerous building and civil engineering projects, some of which are iconic, high profile landmarks. Sato Kogyo's unique and sensitive approach has always been to understand and respect the customs, people, and social and business cultures of the countries which they are operating in as well as to proactively introduce innovative engineering solutions to build quality buildings and infrastructures. It has been an enriching, worldly experience for our staff in the overseas offices in the past decades and we are well positioned to undertake more and bigger projects in these dynamic economies.

Victoria Theatre & Concert Hall (Singapore)


National Museum of Singapore (Singapore)


Marina Bay Cruise Centre (Singapore)


Telin-3 Data Centre (Singapore)


Rolls-Royce Regional Headquarters and Aero Engine Assembly Plant (Singapore)


Buddha Tooth Relic Temple & Museum (Singapore)


New Supreme Court Building (Singapore)


The Helix and Marina Bayfront Bridge (Singapore)

Fort Canning Tunnel (Singapore)


LEFT: Bencoolen Station
RIGHT ABOVE: Mattar Station Tunnel Work Area
RIGHT BELOW: Bedok North Station

Mass Rapid Transit Station and Infrastructures (Singapore)


Bintulu LNG Tank (Malaysia)


ROHM-Wako Electronics (Malaysia) Building A (Malaysia)

HONDA Thai Four-wheel Factory (Thailand)

AEON MALL Parking Tower (Cambodia)

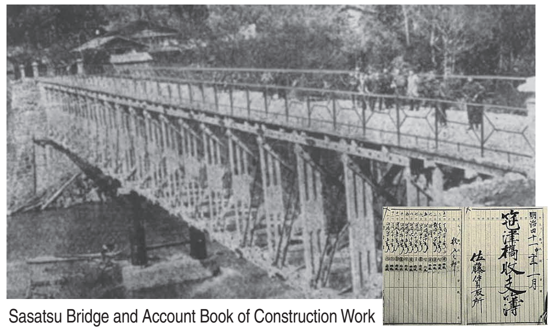
Company History

1862	[Bunkyu]	2	Sukekuro Sato founds Sato Gumi at Yanase Village in Toyama Prefecture
1866	[Keio]	2	Implemented flood prevention works on the 4 main rivers in Toyama Prefecture (Shogawa River, Jinzu River, Jyoganji River, Kurobe River)
1885	[Meiji]	18	Carried out construction of the Tokaido Line (between Numazu and Fuji)
1892		25	Invited Dutchman Johannes de Rijke for major renovation works at the Jyoganji River
1896		29	Opened the Nagoya Branch
1899		32	Rebuilt Honganji Temple's Toyama Betsuin which had been destroyed by fire
1920	[Taisho]	9	Constructed Toyama City Hall
1931	[Showa]	6	Reorganized and established Sato Kogyo Co., Ltd.
			Opened the Tokyo Branch
1951		26	Opened the Sapporo Branch, followed by the opening of branches at 9 power company locations
1956		31	Designed and constructed Yotsuya Cooporas, the very first high-end apartment built in Japan
1959		34	Achieved the tunnel digging speed record in Japan of 25.1 m/day during the winter season's construction of the Kurobe Tunnel
			Publicly listed(Started OTC trading on the TSE. Listed on the 2nd section of the Tokyo, Osaka, and Nagoya stock exchanges in 1961; listed on the first section in 1962)
1961		36	Opened the SATO Museum for the 100th anniversary
1965		40	Developed a fully automated shield tunnel boring machine
1968		43	Completed development of the "TM450GM," Japan's largest tunnel boring machine
1972		47	Established the Central Technical Research Institute as a part of the company's 110th year anniversary endeavors
1973		48	Achieved Japan's record for digging speed with the TBM of 62.18 m/day, 670 m/month during the construction of the 2nd Arikabe Tunnel (for the Tohoku Shinkansen bullet train)
1980		55	Utilized the world's largest tunnel boring machine(12.84 m) for the construction of Tohoku Shinkansen's 2nd Ueno Tunnel
1981		56	Completed construction of the Benjamin Sheares Bridge in Singapore
1991	[Heisei]	3	Completed the Georgian Terrace Project in Atlanta Georgia, USA
1992		4	Completed the first ever revolving roof "Ball Dome" in Japan
			Participated in the J-League; started the Yokohama Flügels('92–'99)
1993		5	Achieved Japan's digging speed record of 260 m/month for a multi-track tunnel by using the NATM blasting method (Hokuriku Shinkansen's Gorigamine Tunnel—Ueda project construction section)
			Participated as the implementing body to open "Rhythm", the first large-scale factory outlet in Japan (Saitama)
1994		6	Awarded the Japan Society of Civil Engineers' "Tanaka Prize" for restoring the Momosuke Bridge, the first ever restoration of a historical civil engineering structure in Japan
			Used a world's largest diameter (14.18 m) double shield tunnel boring machine for the construction of the Tokyo Metro Namboku Line's Azabu section construction
1995		7	Restoration work of Taikai Station for KOBE Earthquake Disaster
1997		9	Developed the soil temperature control system "SOLCON" to support the healthy growth of grasses
1999		11	Developed and implemented the world's first automated robot spraying system for tunnels
2000		12	Achieved Japan's digging speed record of 708 m/month with a TBM(construction of Hamamatsu Tunnel of the Tomei Expressway No. 2)
			Achieved Japan's digging speed record of 785 m/month with a TBM(Toyama Prefecture tunnel construction)
2001		13	Awarded ISO 09001 and ISO 14001 certifications in all 11 branches in Japan
2002		14	Filed a petition to begin corporate reorganization procedures; commencement order granted. (Corporate reorganization proceedings completed in 2009; delisted in 2002)
2004		16	Completed construction of the Hakkoda Tunnel, the longest inland tunnel in the world in Ichinowatari
2006		18	Established "WATERLINE," the first canal renaissance concept promoted by the Tokyo Metropolitan Government's Bureau of Port and Harbor
2011		23	Supported Japan Football Association's "JFA Heart Project"
2012		24	Concluded the first disaster relief agreement with Sendai city government (Provision of a sport facility in Asuto Nagamachi as an emergency evacuation site)
2013		25	Started in the solar power system business (Kikukawa City Kurasawa Mega Solar)
2014		26	Completed the renewal and renovation project of a historical building in Singapore "Victoria Theatre & Concert Hall"
2015		27	Construction work started at LINEAR CHUO SHINKANSEN Minami-Alps Tunnel Yamanashi Section
2017		29	Completed Mt.FUJI WORLD HERITAGE CENTRE, SHIZUOKA
2018		30	Opened the Yangon Branch Started The Project for Improvement of Magway General Hospital

Honganji Temple's Toyama Betsuin and SATO KOGYO Company Badge

■ Reconstruction of Honganji Temple's Toyama Betsuin and the company badge of the SATO KOGYO Co., Ltd. ■

In 1899, Toyama city suffered from a massive fire, and Nishi Honganji Temple's Toyama Betsuin was also set on fire.
Betsuin at the time was getting ready for the 400th anniversary of Rennyo-shounin's death, but such was considered not possible due to the damage caused by the massive fire.
However, Sukekuro Sato, the founder of Sato Kogyo, decided to reconstruct Betsuin himself.
Supervising the reconstruction work personally, the Betsuin project was completed in just over a month. Moreover, he donated the total construction price.
The anniversary ceremony was performed successfully. The following year, Kyounyo-shounin visited Sato's residence and placed the Japanese half-coat (*haori*) with the "Sagari-fuji" symbol over Sukekuro's shoulders to express his appreciation for the reconstruction work.
After Sukekuro's death, Sukekuro II added the Chinese character "佐"to the symbol and started using it as the company's logo.



Sasatsu Bridge and Account Book of Construction Work

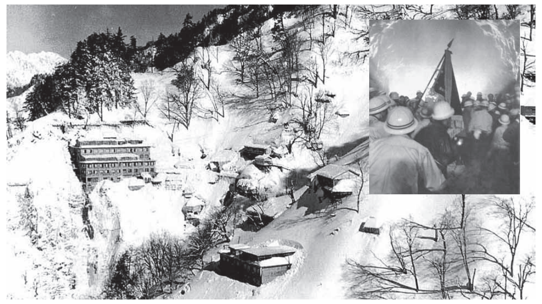
■ Toll bridges and the Sasatsu Bridge II ■

The founder, Sukekuro Sato, came up with the idea of something quite similar to the current PFI (Private Finance Initiative) more than 100 years ago and built many private toll bridges, "Chintori-bashi", over the rivers in Hokuriku, the northern part of Japan, which made the people's life more convenient.
The Sasatsu Bridge over the Jinzu River (Toyama pref.) was also built by Sukekuro and converted into a toll bridge.
The first Sasatsu Bridge was destroyed by runoff from melting snow and it had been considered impossible to rebuild it due to both technical and financial difficulties. However, in 1892, at the request of the prefectural government, Sukekuro attempted to rebuild the bridge using the platform method at his own expense.
This method has now evolved to become the Caisson method, and the upper part of the bridge was built in a truss shape and was the longest span in Japan at that time.

Yotsuya Cooporas

■ Yotsuya Cooporas ■

In the 20's during the Showa era, there were few quality reinforced concrete housing complexes. Following the legal reform, we dared to enter into the private housing complex market where no one ever did.
In 1956, we completed "Yotsuya Cooporas", the Japan's first condominium type high-rise housing complex, was built by a private company. This is located in the high-end residential area of Yotsuya, Tokyo, in coordination with JCB, the Japan Credit Bank.
"Cooporas" is a Japanese-born English word, meaning a cooperative house.
It is not just a housing complex but residences based on discussions with tenants, the designer and the contractor covering the whole process from acquisition of land, design, and construction, and incorporating the individual life styles of the tenants.
Since then, "Cooporas" has become synonymous with a housing complex.



Sakuroudani Lodging and Snap shot when Kurobe Tunnel was bored through

■ Kurobe Tunnel ■

Kurobe Tunnel in the 4th construction area of the No.4 Kurobe River power station.
At the site, which is an important transport route, large-size equipment such as power plant equipment and hydraulic steel pipes had to be sent from the dam to the underground power station approximately 10 km downstream, and Sato Kogyo was in charge of this area of 6,666 m, including two-thirds of the downstream area (and the digging work for an area of 1,150 m).
Construction started in August 1956.
The mouth of the Kurobe Tunnel was located in the Sakurou Valley about 600 m above the Sennin Valley where the base camp was located.
Materials and food had to be sent up the sheer cliff by climbers until the tramway between the two points was constructed.
In order to maintain the delivery time, the work had to continue during the winter.
In December 1956, full-face excavation was carried out and on January 23, 1959, We established a Japanese digging record of 25.1 m/day.
The tunnel broke through on February 8, and the center point difference was only 2.3 cm.

Benjamin Sheares Bridge and 5 dollar coin in Singapore

■ Benjamin Sheares Bridge ■

First long bridge in Singapore connecting Changi Airport and downtown.
For this project according to the international package deal tender system consisting of the survey, design and construction, our bridge plan, using mainly pre-stressed concrete, was selected.
Construction started in January 1977 and was completed in September 1981.
In memory of the President Benjamin Sheares, who died during his period of service and before the completion, the bridge was named the "Benjamin Sheares Bridge".
A 5 dollar coin and 50 dollar note were issued to mark the completion. The bridge has become well-known as a national symbol worldwide.
The Benjamin Sheares Bridge was praised for its construction technique and aesthetic design and won the Tanaka prize awarded by the Society of Civil Engineering in 1981.