Corporate Profile

IHI Infrastructure Systems Co., Ltd.

IHI Realize your dreams

“Contributing to the development of society through tech nology”

“Human Resources is the only and the largest asset of the company”

Tatara Bridge

Introduction

Under the IHI Group management principles, “Contributing to the development of society through technology” and “Human resources is the only and the largest asset of the company.”, IHI Infrastructure Systems Co., Ltd. has mobilized excellent human resources and high technological capabilities, backed by abundant experience, and pushed forward with the aim of providing high-quality social capital which accommodates the needs of society at the same time as being safe and reliable.

As well as constructing and repairing bridges both in Japan and abroad, as a countermeasure to facility obsolescence and from the perspective of operation and maintenance, we will join our affiliate, IHI Construction Service Co., Ltd., in focusing on the inspection, diagnosis, large-scale modification, renewal, etc. of bridges and floodgates, the needs for which are set to intensify, and strive to strengthen our efforts, expand our business and fulfill our mission.

Furthermore, we would like to disseminate our design/production/construction technologies accumulated over years of experience both in Japan and abroad, aim to participate in the concession business and develop overseas strategical bases in Asia, Europe and the U.S. in our desire to significantly boost the development of a global society.

As well as steel structures such as bridges, we will also focus our strengths on providing products and services such as seismic isolation and vibration damping systems for buildings to enable safe, secure and comfortable lifestyles.

IHI Infrastructure Systems will ensure compliance and proactively reform working styles, with both its executives and employees alike standing in solidarity to achieve our ultimate goal of promoting regional development as a member of society through activities related to safety and health, environmental management activities and so on.

Kazuya Ueda
President

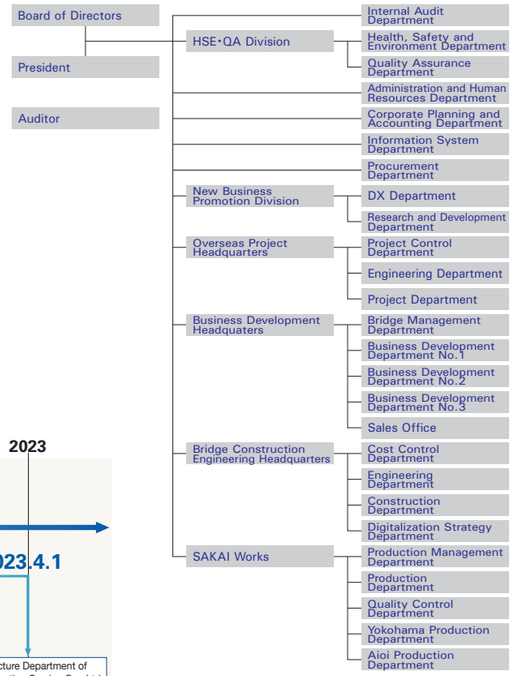
Realize your dreams

Company profile / Organization / History

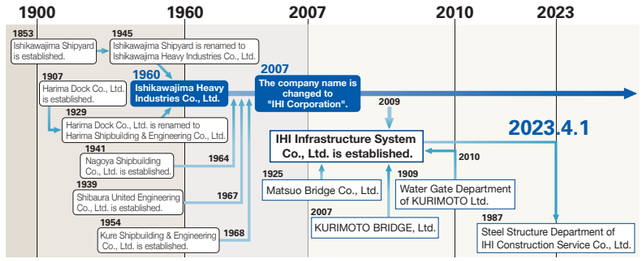
■ Company profile

Name:	IHI Infrastructure Systems Co., Ltd.
Head office:	3 Ohama-nishimachi, Sakai-ku, Sakai city, Osaka 590-0977 Japan TEL:+81-72-223-0981 FAX:+81-72-223-0967
Capital:	1,000 million yen
Representative:	President Kazuya Ueda
Employees:	869 (as of April 2023)
Year of establishment:	November 1, 2009
Business activities:	The design, fabrication, construction, assessment,repair and maintenance of bridges, gates and various other steel structures. The fabrication, sales and installation of disaster prevention equipments.

■ Organization



■ History



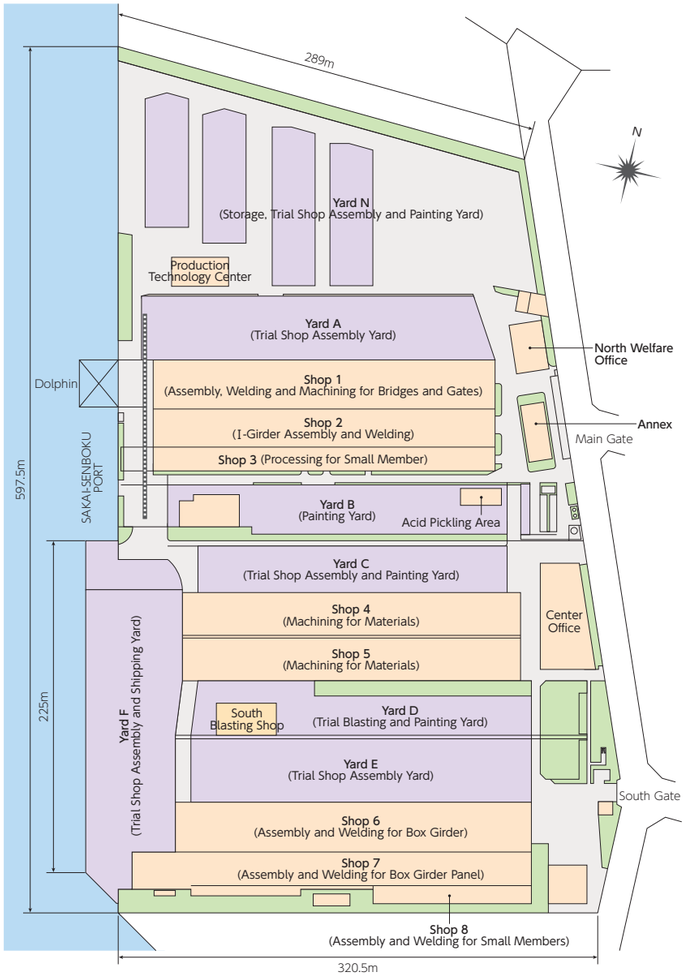
(Head office / Sakai Works on March 2023)

Sakai Works

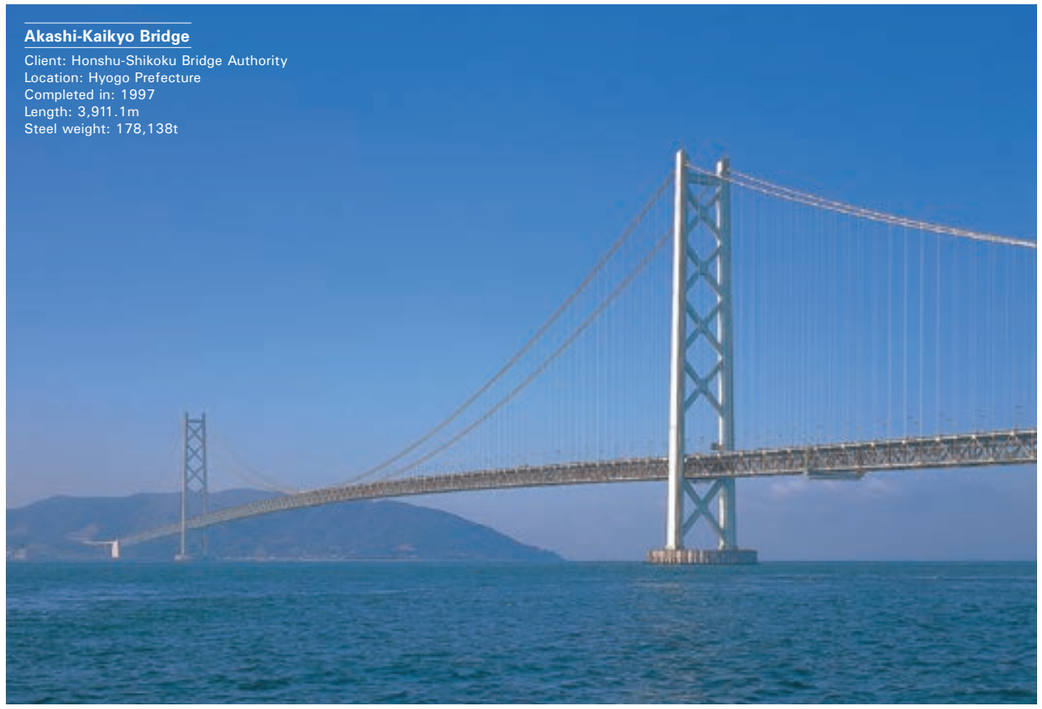
Sakai Works is located in Osaka Sakai City's coastal industrial zone. With the efficient operational process using BIM system and skilled man power in high technology and technique, the Sakai Works, on a daily basis, provides high quality products and contributes to society by providing safe and reliable social infrastructure maintenance.

Sakai Works, with a total site area of 174,745㎡ is equipped with variety of NC machines, articulated robot systems, automatic steel girder production line, automatic panel production line for box girders, and one of the largest horizontal boring machine in Japan. Outside along the Sakai Semboku Port is a 225m long wharf equipped with 200 ton jib crane. The factory has a significant aspect for constructing large-scale structures, such as steel bridges and dams and river gates, and also suitable for marine transport using a crane vessel.

As in the past, today Sakai Works' products and technologies that support society will be introduced widely to both Japan and overseas.

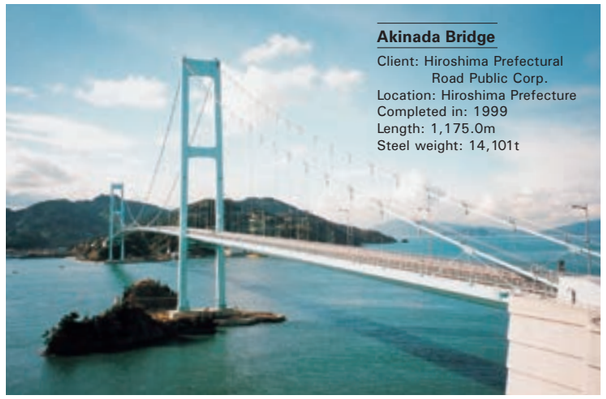


Bridge projects (in Japan)



Akashi-Kaikyo Bridge
Client: Honshu-Shikoku Bridge Authority
Location: Hyogo Prefecture
Completed in: 1997
Length: 3,911.1m
Steel weight: 178,138t

Daini Ondo Bridge
Client: Hiroshima Prefecture
Location: 8 Kegoya, Kure city, Hiroshima Prefecture-1 Tsuboi, Onndo-machi
Completed in: 2011
Length: 292m
Steel weight: 4,764t



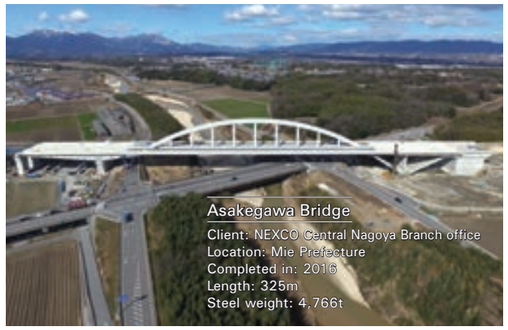
Akinada Bridge
Client: Hiroshima Prefectural Road Public Corp.
Location: Hiroshima Prefecture
Completed in: 1999
Length: 1,175.0m
Steel weight: 14,101t

Yuri Bridge
Client: Yurihonjo city, Akita Prefecture
Location: Yurihonjo city, Akita Prefecture
Completed in: 2013
Length: 190.5m
Steel weight: 2,614t

Hakucho Bridge
Client: Hokkaido Regional Development Bureau
Location: Hokkaido
Completed in: 1996
Length: 1,380.0m
Steel weight: 19,766t

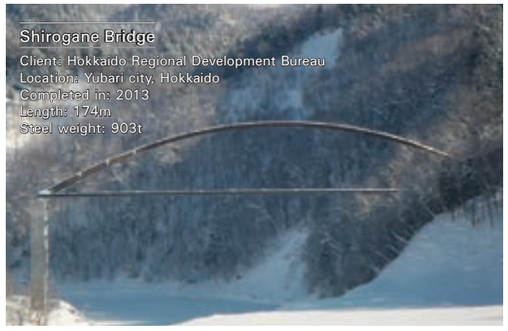
Iwakurojima Bridge (Great Seto Bridge)
Client: Honshu-Shikoku Bridge Authority
Location: Kagawa Prefecture
Completed in: 1986
Length: 720m
Steel weight: 33,258t

Uminomori Bridge
Client: Tokyo
Location: Tokyo
Completed in: 2020
Length: 249.5m
Steel weight: 6,337t



Asakegawa Bridge
Client: NEXCO Central Nagoya Branch office
Location: Mie Prefecture
Completed in: 2016
Length: 325m
Steel weight: 4,766t

Tsukiji Bridge
Client: Tokyo
Location: Tokyo
Completed in: 2014
Length: 245m
Steel weight: 5,525t



Shirogane Bridge
Client: Hokkaido Regional Development Bureau
Location: Yubari city, Hokkaido
Completed in: 2013
Length: 174m
Steel weight: 903t

Bridge projects (in Japan)

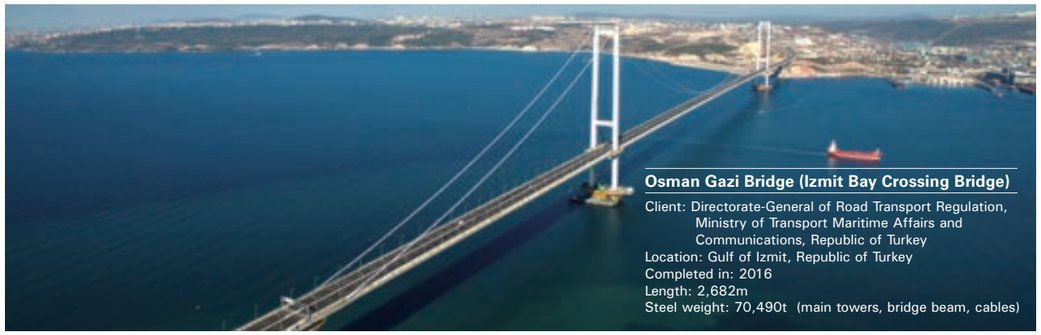
Tokyo Bay Aqua-Line
Client: Trans-Tokyo Bay Highway Corporation
Location: Tokyo, Chiba Prefecture
Completed in: 1996
Length: 4,384.4m
Steel weight: 24,424t

Sekiguchi Bridge
Client: NEXCO Central
Location: Sekiguchi, Atsugi city, Kanagawa Prefecture
Completed in: 2013
Length: 289m, 55m
Steel weight: 3,209t

Namamugi JCT
Client: Shuto Expressway Co., Ltd.
Location: Tsurumi Ward, Yokohama City
Completed in: 2016
Length: 336m (Up main road, outer loop), 340m (Down main road, inner loop), 299.87m (B connecting road), 292.716m (D connecting road), 86.86m (Kishitani-Namamugi Line), Pier
Steel weight: 10,280t

Hinoki North Elevated Bridge
Hinoki Central Elevated Bridge
Hinoki South Elevated Bridge
Nakasone Elevated Bridge
Client: Chubu Regional Bureau, Ministry of Land, Infrastructure, Transport and Tourism
Location: Hinoki-cho, Ogaki city, Gifu Prefecture
Completed in: 2012
Length: 284m, 143m, 162.5m, 185m, 289m
Steel weight: 2,178t 2,103t 1,483t 1,275t

Bridge projects (Overseas)



Osman Gazi Bridge (Izmit Bay Crossing Bridge)
Client: Directorate-General of Road Transport Regulation, Ministry of Transport Maritime Affairs and Communications, Republic of Turkey
Location: Gulf of Izmit, Republic of Turkey
Completed in: 2016
Length: 2,682m
Steel weight: 70,490t (main towers, bridge beam, cables)

Nhât Tân Bridge
Client: Ministry of Transport of Vietnam
Location: Hanoi, Vietnam
Completed in: 2014
Length: 1,500m
Steel weight: 14,500t

Second Bosporus Bridge
Client: The Ministry of Transportation of the Republic of Turkey
Location: Istanbul, Turkey
Completed in: 1988
Length: 1,090m
Steel weight: 32,000t

Megna Bridge
Client: Bangladesh People's Republic Road Transport and Bridge Ministry Road Bureau National Highway Department
Location: Near Dhaka, Bangladesh
Completed in: 2020
Length: 930m
Steel weight: 6,057t

Huey P Long Bridge Widening
Client: Louisiana Department of Transportation and Development
Location: Louisiana, U.S.A.
Completed in: 2012
Length: 726m
Steel weight: 16,000t

Bridge maintenance

We are urged by society to effectively utilize existing social capital stock and extend its lifetime. Our challenges include not only repairing bridges deteriorated and damaged over years to restore their original state, but also reinforcing and remodeling them to improve their performance for increasing traffic volumes, seismic proof and other future demands.

Seismic reinforcement work

Seismic reinforcement work on Arakawa Wangan Bridge

Remodeled the intermediate support point area of the Arakawa Wangan Bridge (7 span Cantilever truss, total span: 840m) to secure resistance from Level 2 earthquakes (of the offshore Southern Hyogo Prefecture earthquake class)

Client: Metropolitan Expressway Company Limited

Improved earthquake resistance of bearings and couplers

Replaced bearings with a reaction force of 10,000 KN, and installed a bridge collapse prevention device to improve the earthquake resistance of the bridge.

Before (Pivot roller bearings) → **After** (Rubber bearings)

Client: Metropolitan Expressway Company Limited

Seismic reinforcement work overseas

IHI Infrastructure carried out large-scale bridge seismic reinforcement projects in Istanbul, Turkey. To provide for the future massive earthquakes, we have completed the seismic strengthening project that consists of four sections, including the first and second Bosporus bridges.

Client: Ministry of Public Works, Republic of Turkey

Reinforcement of corners and supporting points of steel bridges

Reinforced the corners and supporting points of a steel bridge over 40 years old located on the Metropolitan Expressway, in order to maintain safety and driving comfort.

Client: Metropolitan Expressway Company Limited

Widening

Widening work is carried out in order to mitigate chronic congestion on expressways. Projects in city centers require considerably challenging design, fabrication and implementation techniques, as they involve the renovation of structures within limited space while ensuring continuous traffic flow.

Client: Nagoya Expressway

Bridge maintenance projects

Sabane Bridge (Upgrade of Seismic Performance)

Client: Yamagata Prefecture
Location: Obanazawa City, Yamagata Prefecture
Construction overview: Replacement of Bearing
Completed in: February 2016

Wakato Bridge (Rehabilitation)

Client: Kitakyushu City Road public corporation
Location: Kitakyushu City, Fukuoka Prefecture
Construction overview: Connection of Stell Deck
Reinforcement of Truss Beam
Completed in: October 2017

Wakato Bridge (Rehabilitation)

Client: Kitakyushu City Road public corporation
Location: Kitakyushu City, Fukuoka Prefecture
Construction overview: Replacement of hannger,
Cable-Band Bolt etc
Completed in: October 2012

Rainbow Bridge (Rehabilitation)

Client: Metropolitan Expressway Company Limited
Location: Minato-ku, Tokyo
Construction overview: Repaint of Main Cable
Construction overview: Coking the cable band
Completed in: September 2016

1st & 2nd Bosphorus Bridge Rehabilitation Project

Client: Ministry of Public Works and Settlement,Turkey
Location: Istanbul, Turkey
Construction overview: Replacemento of Hanger Cables,Main Cable Wrapping etc
Installation of Dehumidification System
Completed in: April 2016

Arakawa-Wangan Bridge (Upgrade of Seismic Performance)

Client: Metropolitan Expressway Company Limited
Location: Koto-ku, Tokyo
Construction overview: Reinforcement of Truss Point
Installation of Damper
Installation of bridhe collapse prevention device
Completed in: March 2013

Erection

Introduction of our cutting-edge technologies in erection

Erection of cables of suspension bridge

Air spinning (AS) construction method

World's top class suspension bridge cable "Aerial erection technology"

The cable erection of a suspension bridge has two methods - namely, the Air Spinning (AS) method and the Pre-fabricated Parallel Wire Strand (PPWS) method.
The Air Spinning Method is a method to erect cables, by spinning small 5 mm dimension wires one by one. We use the low tension control method, in order to ensure quality and workability. Unlike other manufacturers, we have experience in the erection of overseas suspension bridges using the AS method. Through long experience, we have developed and established know-how on the AS method, including quality control, high-speed erection, adaptation to longer span bridges, and improved AS erection machineries which enable 24 hours seamless operation.

Overhanging erections for cable stayed bridges

Balancing erection method

"Floating balance toy"

The usual method for the construction of cable stayed bridges is to erect the girders in the side span at first, and then to erect the center span by the cantilever erection method. However, this method requires an underwater bent for the erection of the side span, and this can have a substantial effect on the environment.
We provide a solution to this problem by the "Balancing Erection Method", where the main girder is erected from a tower, to both sides of the axis direction, by using a "Diagonal Bent". This method does not require an underwater bent. Although this may look like some kind of balancing toy, and you may think it is unstable, actually good stability is secured by applying our advanced position control technologies. This erection method is stable even during an earthquake or typhoon.

Cable erection method

Straight-line cable erection method

Making the erection of arches more efficient by using preload

The cable erection method is extremely challenging and labor-intensive, and typically adopted in constructing arches. Here, the bridge body is suspended by hanger cables from a main cable fixed between pylons, meaning the deflection may constantly changes according to each step of erection, and requiring the length of the hanger cables to be frequently adjusted.
In traditional cases, the left and right sides of the bridge body shall be constructed alternately; but by changing the erection sequence to complete one side first, improved method can shorten the moving distance of the workers and minimize the adjustment work of hanger cables by preload.

Batch setting of large blocks using a heavy-duty carrier

Batch setting of large blocks using a heavy-duty carrier

Making narrow areas passable by changing the motions of large carriers on both sides

This method is adopted in many projects for erecting girders on express way or major roads, located with constrained conditions such as a lack of work space for setting up, insufficient capabilities of large cranes, or limited time for erection (e.g. one-night erection.)
Erection work in such cases requires special techniques to transport girders to the correct erection position, avoiding obstacles that may exist on the left, right, top or bottom.
Normally, heavy-duty carrier on both sides are connected by steel bars to fix their interval.
Now, by using a developed sequence to control each vehicle positions, the vehicle motions can be changed by keeping fixed distance between each carriers.
Consequently, the relative position of the carriers can be independently adjusted for pitch and roll, which has expanded the feasible scope of erection work in the case that the width of the transport pathways are constrained.

Large block erection

Erection of large blocks using floating cranes

Large blocks are erected all at once

The floating crane method is a major large-block erection method. When a large block, if long or deformed, is lifted, the girder will cause substantial deformation from the initial lifting until the end of erection another deformation may occur from temperature changes. Simulating these deformations or stress states of the girder in advance will help to ensure safe and accurate erection.

Fast launching erection over heavy traffic

Fast launching erection over heavy traffic

Faster and safer erection above heavy traffic

The launching method means erecting bridge girders fabricated beside the point of erection by launching. With this approach, erection above an existing road, which ordinarily required road closure over three nights, can be completed in one night. We have accumulated expertise on safe erection within short periods of time, even for multi-width bridges, curved girders or other complex conditions. This method thus significantly helps to reduce traffic congestion caused by traffic regulation, and to prevent bad impact on distribution systems.

Seismic isolatation and vibration control projects

Vibration control devices

Vibration control devices are installed on top of high-rise buildings or control towers at airports to dampen vibrations caused by strong winds and tremors when earthquakes strike. Our equipment is deployed at domestic and international.

Vibration control device for offshore crane suspension frames

A vibration control device equipped on the suspension frames of offshore cranes. Reduces the shaking of offshore cranes caused by strong winds and waves and helps to improve the safety of hoisting loads.

Seismically isolated floors

Seismically isolated floor will fulfill its function in both horizontal and vertical directions against earthquakes and minimize the damages.
Once internally installed, the system will protect computers or other essential equipments from earthquakes.

Sound-absorbing panels

Sound-absorbing panels for the underside of elevated bridges

Sound-absorbing panels for the underside of elevated structures, developed with the aim of absorbing reflected sound from the underside of bridges, have a sound-absorbing performance which exceed the requirements of the Ministry of Land, Infrastructure, Transport and Tourism.

Sound-absorbing louvres for underside application

Sound-absorbing panels for underside application

"Shizumaru-kun" – an enclosure with a silencing function

The sound of generators on construction sites significantly effects the surrounding environment. To solve this problem, we have developed "Shizumaru-kun", an enclosure with a silencing function, comprised from panel enclosures for generators installed with a silencing system. Drawbacks of the conventional enclosure were that it was difficult to prevent noise leakage due to exhaust at a single ventilation port and that the temperature rose easily due to easily filling with exhaust gas. In addition to separating the ventilation port, by installing "Shizumaru-kun" which has a "noise preventional gallary" at its intake and a "splitter silencer" at its exhaust port, noise generation was signifcantly suppressed without the internal temperature rising.

Shizumaru-kun

TRIAS

TRIAS is a generalized assembly bridge which can be constructed rapidly and economically.
It can be installed so quickly and easily in any kind of field that it functions as an emergency bridge and transports heavy vehicles immediately.
There are two types of TRIAS: the I-shaped girder type and the truss type, and both of them can be used for various purposes, such as post-disaster recovery or access road for construction.

Hakucho Bridge

Hyuga Ohashi Landing Bridge
Location: Miyazaki Prefecture
Length: 24mx10, 22mx5, 24mx2
Width: 8m
Type: Deck Truss, Through Truss
Load capacity: Live Load B

Erection support

Erection truss for Kuki Bridge
Location: Yamanashi Prefecture
Length: 68m(34m x 2)
Type: Deck truss support
Load capacity: Concrete bridge support work

Post-disaster recovery

Nichinan TRIAS for post-disaster recovery
Location: Miyazaki Prefecture
Length: 40m
Width: 4m
Type: Through TRIAS
Load capacity: 200-t crawler crane

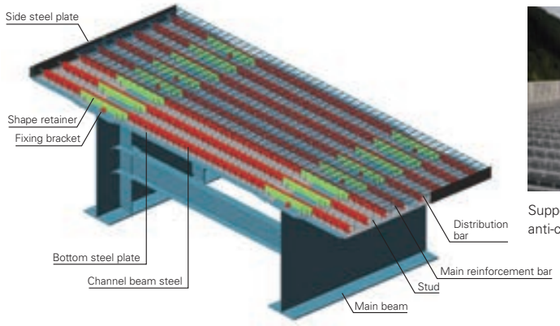
Post-disaster recovery

Ohtoumura TRIAS for post-disaster recovery
Location: Nara Prefecture
Length: 60m (20m x 3 structures)
Width: 6m
Type: I-shaped Girder TRIAS Type II
Load capacity: Live Load B

Channel beam composite slabs

These composite slabs are used on bridges and tunnels and are formed by using channel beam steel to reinforce the bottom steel plate. Easy to install with superior durability, the need for scaffolding can be eliminated by using IS clips and IW nuts.

Outline of a channel beam composite slab



Composite slabs for bridges

Supporting all types of bridges and anti-corrosion specficiations.

Tunnel slabs (precast)

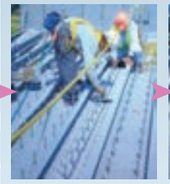
Can be applied to tunnel slabs.
Also supports precast slabs as well as concrete prepared on-site.

IS clips

By using IS clips in composite slab joints, it is possible to work from the top of the bridge without using scaffolding. Insert bolts into the composite slabs prior to installation on-site and secure using IS clips. Support plated bolts and non-plated durable type bolts.

IS clip installation procedures

IS clip installation



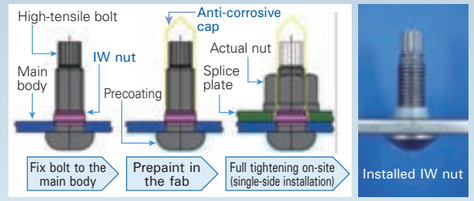
Splice plate intallation

Temporary fastening with nuts

IW nuts

By using IW nuts in composite slab joints, it is possible to work from the top of the bridge without using scaffolding. When constructing plants, by installing bolts with IW nuts and coating the joints as well, on-site coating is not necessary. Supports coated bolts.

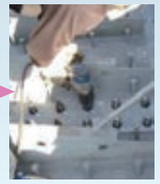
IW nut outline



IW nut installation procedures

Install bolt and paint in the fab

Install splice plate on-site



Temporary and full tightening of actual nut.

Gate projects (Dam)

We are the leading provider of dams and river gates usable for all purposes, that covers from power generation and flood control to safeguarding lives from natural disasters and water utilization in the form of warm water intakes and discharges for river maintenance.
We also focus on emerging needs, such as developing new gate types that Harmonize with the surrounding landscape, protect the environment, and reduce life-cycle costs. Building on these technologies, IHI Infrastructure plays an important role in developing water utilization and flood control infrastructure in Southeast Asia and elsewhere, thereby contribute to the regional economic development.

Yamba Dam

Yamba Dam

Spillway
Crest radial gate: B11.0m x H15.10m x 4 gates
Regular flood discharge facility
High pressure radial gate: B4.85m x H4.85m x 2 gates
High pressure slide gate: B7.525m x H8.162m x 2 gates
Spillway for maintaining water level
High pressure radial gate: B5.0m x H5.0m x 1 gate
High pressure slide gate: B7.750m x H8.593m x 1 gate
Selective water intake:
Water intake 50m^3 /s (Siphon type)
Outlet
Jet flow gate ϕ1.8m x 1 gate
Hollow jet valve ϕ0.8m x 1 gate, etc.

Nam Ngiep I Hydroelectic Power Station

Nam Ngiep I Hydroelectic Power Station

Main Dam
Penstock: Tube ϕ6.76m ~ 3.74m×
Tube length186.055m x 2 lines
Spillway gate: Radial gate B12.25m x H14.71m x 4 gates
Intake gate: Slide gate B6.76m x H6.76m x 1 gate
Draft gate: Slide gate B9.81m x H4.697m x 2 gates
Re-Regulation Dam
Re-Regulation gate: Wheel gate width 5.0m x H5.0m x 1 gate
Re-Regulaiton Intake gate: Wheel gate width 10.0m x H11.1m x 1 gate
Re-Regulaiton Draft gate: Slide gate B9.27m x H7.65m x 1 gate

Yamasuhara Dam

Crest Radial Gate

2001 Kinki Regional Bureau, Ootaki Dam: B10.0m x H14.9m x 4 gates
2006 Kyushu Electric Power Co., Ltd. Ishikawauchi Dam: B10.0m x H16.0m x 4 gates
2008 Kyushu Electric Power Co., Ltd. Tsukabaru Dam:
B7.0m x H6.6m x 8 gates (renovation work)
2009 Shikoku Electric Power Co., Ltd Tsuga Dam:
B8.5m x H9.1m x 8 gates (renovation work)
2017 Wachi Dam B9.00m×H12.70m×4 gates (renovation work)
2018 Yamasuhara Dam B13.697m×H15.533m×1 gate (renovation work)

Kanogawa Dam

High-pressure radial gate

1995 Japan Water Agency, Hinachi Dam:B4.2m x H4.5m x 2 gates
1998 Chubu Regional Bureau, Nagashima Dam: B5.0m x H6.4m x 2 gates
1998 Tohoku Regional Bureau, Tsukiyama Dam: B4.9m x H4.9m x 2 gates
2003 Chugoku Regional Bureau, Sugesawa Dam:
B3.1m x H2.6m x 1 gate (renovation work)
2009 Kyushu Regional Bureau, Kasegawa Dam: B3.8m x H3.9m x 2 gates
2017 Sikoku Regional Bureau, Kanogawa Dam: B4.2m × H7.5m × 2 gates

High-pressure wheel gate

1964 Kinki Regional Bureau, Amagase Dam:
B3.6m x H4.7m x 3 gates (partly renovated in 2006)
1991 Chugoku Regional Bureau, Hattabara Dam: B3.2m x H3.6m x 2 gates
1999 Chugoku Regional Bureau, Nukui Dam: B4.9m x H3.9m x 4 gates
2003 Chugoku Regional Bureau, Haizuka Dam: B3.4m x H3.4m x 2 gates
2010 Kyushu Electric Power Co., Ltd. Hitotsuse Dam:
B1.6m x H2.3m x 1 gate (renovation work)
2016 Kyushu Regional Bureau, Truda Dam Additional discharge gate:
B3.4m×H4.8m×2 gates (Gates 1 and 2)
B2.8m×H3.8m×1 gate (Gates 3) , etc.

Tsuruda Dam

Saigo Dam

Other Outlet

1991 Kyushu Regional Bureau, Ryumon Dam, High-pressure slide gate:
B1.7m x H2.2m x 2 gates (flood spillway)
1995 Kanto Regional Bureau, Miyagase Dam, High-pressure slide gate:
B2.0m x H2.2m x 2 gates (flood spillway)
1998 Hokuriku Regional Bureau, Unazuki Dam, High-pressure slide gate:
B5.0m x H6.2m x 2 gates (flushing spillway)
2006 Chugoku Regional Bureau, Haizuka Dam, Tensile radial gate:
B2.2m x H2.1m x 2 gates
(spillway for releasing water for environmental use)
2013 Tohoku Regional Bureau, Ministry of Land, Infrastructure,
Transport and Tourism Isawa Dam, Jet-flow gate: ø2.4m x 1 gate
2016 Kyushu Electric Power Co., Ltd. Saigo Power Station:
Roller gate width17.610m × H10.270m × 2 gates (Flood discharge facility)
2019 Sikoku Regional Bureau, Nagayasuguchi Dam:
Roller gate width10.000m × H19.998m × 1 gate (Flood discharge facility)
Roller gate width10.000m × H19.126m × 1 gate (Flood discharge facility)

Nagayasuguchi Dam

Selective water intake

2006 Japan Water Agency, Takizawa Dam, Intake volume: 40m^3/s (Multistage gate)
2006 Japan Water Agency, Tokuyama Dam, Intake volume: 100m^3/s (Multistage gate)
2008 Tohoku Regional Bureau, Nagai Dam, Intake volume: 20m^3/s
(Telescopic Multistage gate)
2010 Chubu Regional Bureau, Ministry of Land, Infrastructure, Transport and TourismYokoyama Dam, Intake volume: 64.5m^3/s
(Telescope type semi cylindrical gate)
2012 Kanto Regional Bureau, Yunishigawa Dam, Intake volume: 30m^3/s (siphon type)
2016 Kanto Regional Bureau, Futase Dam, Intake volume: 7.5m^3/s Multistage gate
(Membrane type)
2020 Sikoku Regional Bureau, Nagayasuguchi Dam: Water intake 60m^3/s
(Multistage gate gate)

Gate projects (River)

Gates are constructed at rivers to regulate water flow and prevent the backflow of seawater.
The gates are usually closed to store water, which is then used for water supply and sewerage systems as well as in agriculture, industries, power generation and so on.
In case of flooding, the gates shall be opened to let the water flow down.

Ohkouzu Kadou Weir

Weir

1995 Kinki Regional Bureau, Kinokawa Great Weir:B40.0m x H7.1m x 1 gate
1996 Kinki Regional Bureau, Naruka Great Weir: B43.4m x H5.7m x 4 gates and others
2008 Chugoku Regional BureauKobe Weir: B39.0m x H3.1m x 4 gates
2012 Hokuriku Regional Bureau, Ohkouzu Kadou Weir: B37.95m x H6.75m x 2 gates and others
2012 Hokuriku Regional Bureaulshikari River head work: B42.0m x H4.62m x 2 gates and others
2013 Hyogo Prefecture, Rokkai Weir: B21.03m x H3.42m x 2 gates

Kamihirai Gate

Roller gate

1992 Tohoku Regional Bureau, Oodangawa Gate: B20.3m x H12.7m x 2 gates
1998 Kanto Regional Bureau,Tamazukuri Gate: B23.5m x H11.4m x 2 gates
1998 Tohoku Regional Bureau, Oshiwake Gate: B23.8m x H8.8m x 2 gates
2002 Tokushima Prefecture, Tatara Gate: B19.4m x H3.8m x 1 gate
(Under construction) Tokyo B30.0m × H11.1m × 4 gates

Tsunami countermeasure, tide prevention gate

1970 Osaka, Kizukawa Gate (visor gate): B57.0m x H11.9m x 1 gate
1992 Kinki Regional Bureau, Yodogawa Shore Lock: B24.0m x H3.0m x 1 gate (vertical swing gate)
2001 Osaka, Higashiyokoborigawa Gate: B22.0m x H6.1m x 1 gate (Submergible Radial Gate)
2013 Shizuoka Prefecture, Katsumata River gate: B24.5m x H5.03 x 1 gate (Shell structure sirnit gate)
2020 Iwate Prefecture, Kesengawa Gate: B34.2m × H6.0m × 5 gates (Shell structure sirnit gate)
And many others

Hyakengawa Gate

Rising sector gate

1998 Hokkaido Development Bureau, Nagayama Intake Gate: B10.0m x H2.0m x 1 gate
1999 Aichi Prefecture, Hirokuchiike South Gate: B15.0m x H3.9m x 1 gate
2000 Aichi Prefecture, Nikkougawa No.4 Channel Gate: B22.0m x H3.9m x 2 gates
2002 Chubu Regional Bureau, Sumiyoshi gate: B12.5m x H9.1m x 1 gate
2003 Tohoku Regional Bureau, Ohtanichi Gate: B14.0m x H2.5m x 1 gate
2005 Hyogo Prefecture Ohtanigawa Gate: B11.0m x H3.8m x 1 gate
2007 Kyushu Regional Bureau, Kurumefunadoshi Upstream Lock: B10.0m x H2.8m x 1 gate
2011 Chugoku Regional Bureau, Hyakengawa gate: B33.4m x H6.9m x 3 gates
2014 Chugoku Regional Bureau, Ohashigawa Tenjingawa Gate: B16.4m x H3.5m x 2 gates

Kesengawa Gate

Kizukawa Gate

Penstock & Aqueducts projects

The bifurcated penstock with 800 MPa high-strength steel, which can accommodate larger electric power facilities, is our proven technique. The company has also developed a bifurcated penstock with 1,000 MPa high-strength steel, applicable for actual projects. As for aqueducts, which serve as raw water conveyors, various bridge types can be applied.

Dainin hydraulic power plant

2007 Aichi Prefecture, Toyokawa Aqueduct Bridge (inverse trigonometric stiffening truss type)
(Pipe diameter: 2,000mm, Span: 73.6m)

1967 Tokyo, Ooi No2 Aqueduct Bridge (Langer stiffening type)
(Pipe diameter: 1022A x 2 rows, Span: 79.8 x 2m)

Pressure iron pipe

2004 Shikoku Electric Power Co., Ltd. Matsuo (gawa) No1 Power Plant: ø0.7-2.1m Design hydraulic head of 448 m (renovation work)
2006 Vietnam, Dainin hydraulic power plant: ø1.9-3.3m Design hydraulic head of 770m
2008 Kenya, Sondu Miriu Hydro Power Plant: ø1.7-3m Design hydraulic head of 291m
And many others

Okumino Power plant

Branch Pipe

1999 Chubu Electric Power Co., Ltd. Okumino Power plant: ø3.9m Design hydraulic head of 770m.
2006 Vietnam, Dainin hydraulic power plant: ø3.2m Design hydraulic head of 755m
2006 Kenya, Sondu Miriu Hydro Power Plant: ø3.2m Design hydraulic head of 290m
And many others

1995 Fukushima Prefecture, Niida Aqueduct Bridge
(cable-stayed bridge type)
(Pipe diameter: 500A x 2 rows, Span: 1198 x 2m)

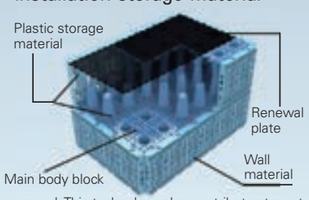
2008 Kagoshima Prefecture, Komenotsu Aqueduct Bridge
(Basket-handle-shaped, Nielsen system Lohse type)
(Pipe diameter: 300A, Span: 59.38 x 2m)

Research and development

Disaster prevention

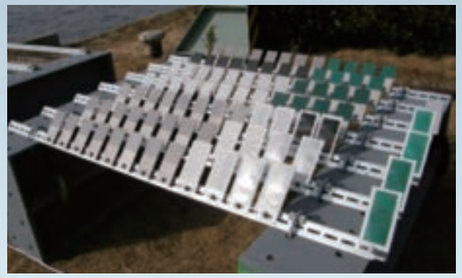
Rainwater storage and infiltration tank "GEOCUBE" method

For suppressing rainwater outflow and rainwater utilization Development of plastic underground installation storage material



Downpours exceeding 100 mm per hour in both major metropolitan and regional areas are becoming a social issue. This product is installed underground to store rainwater quickly and allow it to slowly infiltrate the ground. This technology also contributes to water circulation as a facility allowing stored rainwater to be used effectively.
This water tank forms a water storage space with over a 95% porosity and, due to the fact it is installed undergroud, the area above it can be used effectively.
This product satisfies all of the technological evaluation items required by the Association for Rainwater Storage and Infiltration Technology.

Development of anti-corrosion technologies

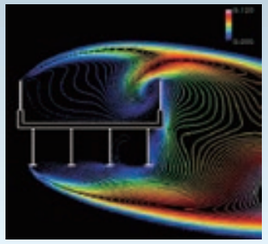


The prevention of corrosion-related degredation of bridges and gates is effective in the improvement of such structures' durability and reduction of LCC (lifecycle cost).
IHI Infrastructure Systems conducts corrosion tests using various anti-corrosion methods and carries out R&D activities to improve anti-corrosion technology.

Wind-resisting technology

Wind resistance evaluation

When constructing long span bridges, we study the wind in order to avoid the distortion and vibration that this causes. We analyzes bridges' wind resistance capability through wind tunnel testing and response analysis, and with numeric data derived from such tests, we provides the most optimum solution to design issues.



Seismic resistance technologies

Seismic resistance performance analysis

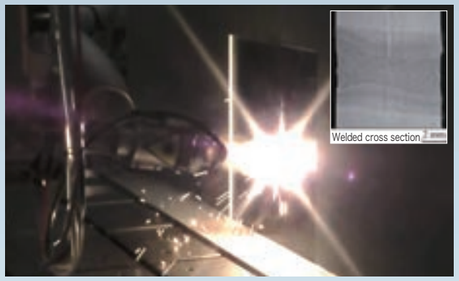
For the safety of structures in case of a large-scale earthquake

Japan experiences frequent earthquakes, exemplified by the damage caused by the Great Hanshin Earthquake and Great East Japan Earthquake of recent years.
There is a high probability that a large scale earthquake will strike in the near future involving multiple plates in the Tokai, Tonankai and Nankai regions, creating concern that civil engineering structures will be damaged.
As well as ensuring that bridges and other civil engineering structure are not damaged when an earthquake strikes, it is necessary to maintain the health of such items to secure lifelines.
IHI Infrastructure Systems is engaged in ongoing efforts to secure the seismic resistance of such structures.

Welding technologies

Laser repair welding

Laser repair welding technology for existing bridge members



We are developing repair welding technology using laser welding as an efficient repair technology for aging social infrastructure. By irradiating the crack generation site with a laser, which is characterized by deep penetration welding, it is possible to repair and weld through cracks in one pass from one side.

CO_2 gas shielded arc welding in traffic vibration

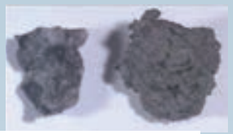
Application to on-site welding in service

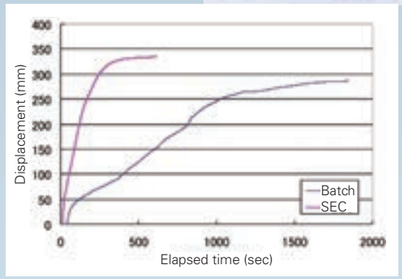
As a part of the repairs and reinforcement of social infrastructure predicted to become even more necessary in the future, we have used an actuator to reproduce the vibration assumed to occur during repair work on concrete slabs under real road conditions, in order to investigate welding material and conditions where defects would not easily occur.

Wind-resisting technology

Wind resistance evaluation

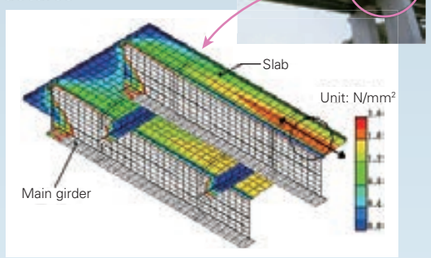
When constructing long span bridges, we study the wind in order to avoid the distortion and vibration that this causes. We analyzes bridges' wind resistance capability through wind tunnel testing and response analysis, and with numeric data derived from such tests, we provides the most optimum solution to design issues.





Temperature-stress analysis

Countermeasures against the cracking of concrete structures



In a construction project involving a concrete structure, cracking sometimes occurs due to temperature stress, dry shrinkage and other actions associated with internal heat generated after concrete casting. To solve this issue, we are engaged in developing technologies to accurately simulate temperature and strain behaviors during construction by using FEM temperature-stress analyzer. For bridges, we have employed this method as a countermeasure against cracking in concrete structures, including slabs, girders, abutments, curbs and guard walls.

Load testing equipment

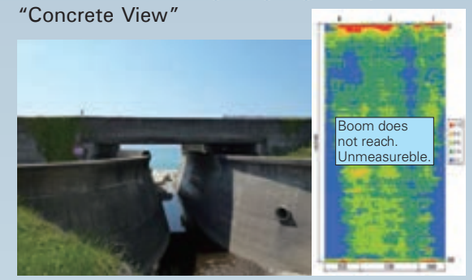
Tests related to concrete

Various tests relevant to concrete are performed with the use of the following test equipment:
- 2,000-, 1,000- and 500-kN fatigue testers
- Wheel load fatigue testing equipment
- Load testing equipment
  (large vibration tables, walls, reaction force floors, etc.)
- Material testing facilities
  (universal testing machines, freeze-thaw testers, fast salt permeation test equipment, etc.)

Diagnostic technologies

Non-destructive, non-degrading diagnosis system

"Concrete View"



Concrete View uses spectrometry to make the concentration of chloride ions on the surface of concrete visible. Concrete View is anticipated to improve the efficiency of maintenance because it can predict areas which will deteriorate due to salt erosion, therefore can be used for position screening in detailed investigations, estimating repair area and used for incoming salt simulation.

Measurement of concrere flatness

FLATVIEW

FLATVIEW can measure and visualize the flatness of the concrete surface before hardening. By measuring at the surface finishing stage, it is possible to instruct the plasterer as appropriate on the correction points, and it is expected that the correction work after the concrete is hardened will be reduced.

Judgment device of concrete filling

Smart Color Analyze Sensor

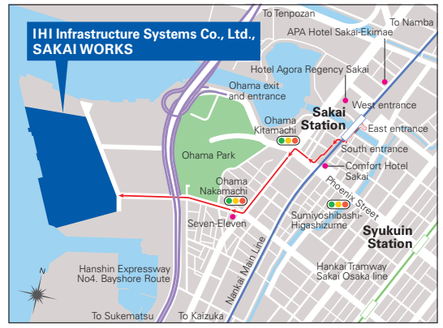
Smart Color Analyze Sensor is a concrete filling judgment device that uses an optical fiber and a digital RGB judgment device. The tip of the sensor is miniaturized and can be removed after judgment, leaving no foreign matter on the concrete structure.

Each base / Group company

In addition to offices and sales offices, we are developing businesses that contribute widely to society by making the most of the Group's base network. We aim to further strengthen and expand our global network and global relations for the future.

Head office / Sakai Works

◎Nankai Line
About 5 minutes by car
About 15 minutes on foot from "Sakai" station.

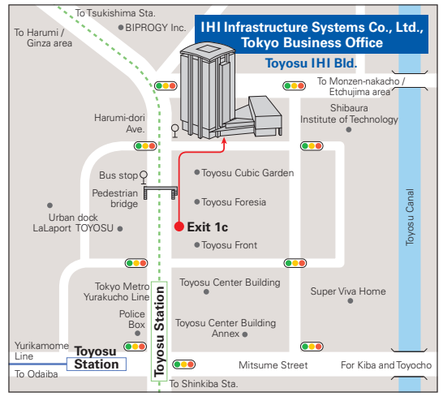


Tokyo Business Office

◎Subway Yurakucho Line
About 5 minutes on foot from exit "1c" of "Toyosu" station.

◎New Transit Yurikamome Line
About 10 minutes on foot from "Toyosu" station.

◎Highway: Route 9, Metropolitan Expressway "Edagawa" exit
(from the Wangan area)
"Kiba" exit
(from the center of Tokyo)



Business offices

•Head office, Sakai Works
3 Ohamanishi-machi, Sakai-ku, Sakai city,
Osaka, 590-0977, Japan
TEL+81-72-223-0981 FAX+81-72-223-0967

•Sakai Works, Yokohama Production Dept
11-1,11-2 (Kamome-chiku), Shin-sugita-cho,
Isogo-ku, Yokohama city,
Kanagawa, 235-0032, Japan

•Sakai Works, Aioi Production Dept
5292, Aioi, Aioi city,
Hyogo, 678-0041, Japan

•Tokyo Business Office
Toyosu IHI Bld., 1-1, Toyosu 3-chome, Koto-ku,
Tokyo 135-8710, JAPAN
TEL+81-3-6204-8538 FAX+81-3-6204-8932

Sales offices

•Business Development Headquarters
Toyosu IHI Bld., 1-1, Toyosu 3-chome, Koto-ku,
Tokyo 135-8710, JAPAN
TEL+81-3-6204-8533 FAX+81-3-6204-8931

•Business Development Department No.1
Toyosu IHI Bld., 1-1, Toyosu 3-chome, Koto-ku,
Tokyo 135-8710, JAPAN
TEL+81-3-6204-8534 FAX+81-3-6204-8931

•Business Development Department No.2
Toyosu IHI Bld., 1-1, Toyosu 3-chome, Koto-ku,
Tokyo 135-8710, JAPAN
TEL+81-3-6204-8535 FAX+81-3-6204-8931

•Hokkaido Sales Office
10F, Shin-Hokkaido Bld., 3-1, Kita7jonishi 4-chome,
Kita-ku, Sapporo city,
Hokkaido, 060-0807, Japan
TEL+81-11-788-4151 FAX+81-11-788-4261

•Tohoku Sales Office
Taijyu Seimei Sendai Honcho Bld., 1-1,
Honcho 1-chome, Aoba-ku, Sendai city,
Miyagi, 980-0014, Japan
TEL+81-22-267-3789 FAX+81-22-267-3725

•Kitakantou Sales Office
Kuruwabashi Bld., 2-5-2, Otemachi
Maebashi city, Gunma, 371-0026, Japan
TEL+81-27-212-3693 FAX+81-27-212-3692

•Chubu Sales Office
3F,BPR PLACE Nagoyamarunouchi,16-4,
Marunouchi1-chome, Naka-ku,
Nagoya city, Aichi, 460-0002, Japan
TEL+81-52-253-5809 FAX+81-52-253-5893

•Osaka Sales Office
Nakanoshima Festival Tower West Bld., 2-4,
Nakanoshima 3-chome, Kita-ku,
Osaka, 530-0005, Japan
TEL+81-6-7730-9825 FAX+81-6-7730-9827

•Hyogo Sales Office
Daido Bld., 5-2-15, Miyukidori, Chuo-ku, Kobe city,
Hyogo, 651-0087
TEL+81-78-241-1856 FAX+81-78-241-1856

•Chugoku Sales Office
4F, No.2 Teraoka Bld, 9-27, Hikarimachi1-chome,
Higashi-ku, Hiroshima city, Hiroshima, 732-0052, Japan
TEL+81-82-567-5737 FAX+81-82-567-5738

•Kyushu Sales Office
Fukuoka General Bld., 11-1, takasago 1-chome, Chuo-ku,
Fukuoka city, Fukuoka, 810-0011, Japan
TEL+81-92-523-4375 FAX+81-92-523-4361

•Okinawa Branch Office
Asahi Seimei Okinawa Bld., 14-3 kumoji 2-chome,
Naha city, Okinawa 900-0015, Japan
TEL+81-98-860-2331 FAX+81-98-863-7122

•Istanbul Branch (Republic of Turkey)

•Bucharest Branch (Romania)

•Dhaka Branch (Bangladesh)

•Yangon Branch (Myanmar)

•Asia Engineering Center (Vietnam)

•Europe Engineering Center (Republic of Turkey)

Group companies

•IHI Construction Service Co.,Ltd.
Toyosu IHI Bld., 1-1, Toyosu 3-chome, Koto-ku,
Tokyo 135-8710, JAPAN
TEL+81-3-6204-8480 FAX+81-3-6204-8950

•IHI INFRASTRUCTURE ASIA Co.,Ltd.
Plot CN4.2A, Dinh Vu Industrial Zone, Dinh Vu–Cat Hai
Economic Zone, Dong Hai 2 Ward,
Hai An District, Hai Phong City, Vietnam
TEL+84-225-8830112

•I&H Engineering Co.,Ltd.
Plot No.3, Kalakone Village, Myaungdagar Steel Industrial Zone,
Hmawbi Township, Yangon Region,
The Republic of the Union of Myanmar

•Alpha Systems Co.,Ltd.
36, Minamitanabecho, Wakayama city, Wakayama,
640-8254, Japan
TEL+81-73-402-6071 FAX+81-73-402-6072

Front cover: Kansai International Airport Connecting Bridge
(2018 Typhoon No.21 damage recovery project) (P6)
Back cover: Yamba Dam (Gate equipment construction work) (P12)

Yamba Dam (Gate equipment construction work)

IHI Infrastructure Systems Co., Ltd.

Head office, Sakai works 3 Ohama-nishimachi, Sakai-ku, Sakai-shi, Osaka, 590-0977, Japan
TEL +81-72-223-0981 FAX +81-72-223-0967

Tokyo Business Office Toyosu IHI Bld., 1-1, Toyosu 3-chome, Koto-ku, Tokyo 135-8710, JAPAN
TEL +81-3-6204-8538 FAX +81-3-6204-8932

URL: www.ihi.co.jp/iis/english/

- Information contained in this catalog is that as of June. 2023.
- Note that specifications, dimensions and appearance contained in the catalog may be changed without notice for improvement.
- Note that the color tone of the product on the catalog may appear different from that of the actual product for reasons attributable to printing.
- Note that the addresses may be changed.

202306-400CW(DS320) Printed in Japan