Project Accomplishments by AJCE Members

The Study on Water Supply and Sewerage System in Karachi in the Islamic Republic of Pakistan

Principal Firm(s) Nihon Suido Consultants. Co., Ltd. (NSC)

Project Site Karachi, Pakistan

Client Japan International Cooperation Agency (JICA)

Finance JICA

Period February 2006 - July 2008

Type of Project
- Master Plan Study
- Feasibility Study
- Technical Transfer

Project Outline (Objectives)
- to formulate a master plan for development of the water supply and sewerage systems in Karachi up to the target year of 2025
- to conduct a feasibility study on the priority projects selected in the master plan; and
- to pursue technical transfer to Pakistani counterpart personnel in the course of the study.

Details
- The long-term development plans of the bulk water supply system, retail water supply system, construction of new sewerage facilities and rehabilitation of existing sewerage facilities in Karachi were formulated as master plan projects.
- Recommendations on institutional reform were also made for Karachi Water & Sewerage Board (KW&SB) with a view of achieving the two main objectives of (a) improvement of inadequate water supply and sewerage services, and (b) being able to operate / manage the services on a full cost recovery basis by 2025.
- Priority projects were decided to make a substantial improvement of the quality of water supply and sewerage services in the three towns located in the western part of Karachi, namely, North Nazimabad, Gulberg and Liaquatabad.
- Through the development of GIS for planning of water supply system and sewerage system in Karachi, a technology transfer of facility mapping and facility management of facilities was also conducted for Pakistani counterparts in KW&SB by the study team.

Table. Summary of Water Supply Project

Water Project	
Target Area	Karachi Cit y
Target year	2025
Service Population in 2025	32.506 (million)
Sewerage Project	
Target Area	145.3(km2)
Target year	2025
Service Population in 2025	8.849 (million)

Service connection in Karachi city

Project Accomplishments by AJCE Members

Capacity Development Project for Non-Revenue Water Reduction in Jordan

Principal Firm(s)	Nihon Suido Consultants. Co., Ltd. (NSC)
Project Site	Six(6) Middle and Southern Governorates in Jordani; Middle(Balqa, Madaba, Zarqa), Southern(Karak, Tafilah, Ma'an)
Client	Japan International Cooperation Agency (JICA)
Finance	JICA
Period	August 2005 - September 2008
Type of Project	-Technical Cooperation

Project Outline (Objectives)

- to acquire essential concept and technology for NRW reduction for Water Authority of Jordan(WAJ) engineers and technicians
- to acquire the implementation capacity of NRW countermeasures for WAJ
- internal training courses on NRW reduction
- to acquire the practical technology on NRW reduction for WAJ engineers and technicians through field work in pilot area
- to strengthen public awareness activities on NRW counter measures

Details

- JICA Expert Team transferred essential technologies about NRW countermeasure, such as underground leakage survey, leak repair, water meter installation, distribution network management, approaches for apparent loss, and public awareness activities through the combination of lectures and OJT.
- JICA Expert Team conducted the technology transfer on planning and implementation of NRW countermeasures through the OJT in selected pilot areas in six (6) governorates in the middle and southern regions.

Outcome

- Setting of NRW Baselines and Reduction of NRW Level at least by half for Targets in Pilot Area.
- Promotion of Public Awareness Campaign including public hearing, workshop, and Essay Contests.
- Preparation of Guidelines for NRW Management and Training Materials to be used by Jordanian Engineers

Training for Setting of Ultra-sonic Flow Meter

Training for the setting of individual household survey

Public Awareness Students workshop

Project Accomplishments by AJCE Members

Manila LRT Line 1 Expansion Project Phase II

Principal Firm(s) Oriental Consultants Co., Ltd.

ORICONSUL

Project Site Manila, Philippines

Client Department of Transportation and Communications (DOTC), Light Rail Transit Authority (LRTA)

Finance Japan International Cooperation Agency (JICA)

Period Feb. 2002 - Sep. 2008

Type of Project
- ♦B/D, D/D
- ♦Tender Assistance
- ♦C/S

Project Outline

The Project involves the Phase II capacity expansion for the existing LRT Line 1. It is a 15.4 km elevated line with 18 stations running north to south along the Taft-Rizal corridor from Baclaran in Pasay City to Monumento in Kalookan City in Metro Manila. The depot is located at the south end of the line. This line was opened in December 1984 with the design capacity to carry 18,000 passengers per hour per direction (pphpd) of travel. By 1994, the system was running at maximum operational capacity and the need for expansion was identified. Subsequently, the Government of the Philippines carried out a series of improvements to expand the passenger carrying capacity of Line 1. The Phase II expansion has increased the passenger carrying capacity of line 1 to 40,000 pphpd.

Details

The Project consists of the following components :

- ♦Project management support for general management and development of the project management plan, implementation of a project control system, and public relations.
- ♦Engineering services for the detailed design of modification of existing passenger stations, basic design of electric and mechanical works, and preparation of bid documents.
- ♦Assistance in bidding and ROW acquisition.
- ♦Construction supervision.
- ♦Defects liability support.

Project Accomplishments by AJCE Members

New Abay Bridge (HEDASE Bridge) - Project for Rehabilitation of Trunk Road Phase III

Principal Firm(s) Oriental Consultants Co., Ltd. JV with JEC

ORICONSUL

Project Site Blue Nile River, Amhara and Ormia Regions, Ethiopia

Client Government of Ethiopia

Finance Japan International Cooperation Agency (JICA)
- Japanese Grant Aid

Period Mar. 2003 - Dec. 2008

Type of Project
- ♦Basic Design, Detailed Design
- ♦Tendering Procedure
- ♦Construction Supervision

Project Outline

The road section between Goha Tsyion and Dejen belongs to Northwest trunk road that connects the capital of Addis Ababa with the northern agricultural area. This route is also used to carry oil production from Sudan to the capital. However, due to the severe topographical and natural environment and use by heavy vehicles, the route has deteriorated and the existing Abay bridge, which was constructed 60 years ago, is in extremely poor condition. Considering this situation, the Ethiopian Government requested the Japanese Government to rehabilitate this route and to construct a new Abay bridge using Japanese Grant Aid Scheme.

Details

The Project consists of the following components :
Improvement of 40 km of trunk road to a two-lane asphalt paved structure, including drainage and retaining walls.
Construction of the new Abay (HEDASE) Bridge;
- ♦Bridge length & span arrangement : 303 m (70+145+70+18)
- ♦Bridge width : 9 m
- ♦Bridge type : Extra-dosed type

Project Accomplishments by AJCE Members

Study on Climate Impact Adaptation and Mitigation in Asian Coastal Mega Cities, - Case of Metro Manila -

Principal Firm(s)	CTI Engineering International Co., Ltd
Project Site	Metro Manila in THE PHILIPPINES
Client	Japan Bank for International Cooperation (JBIC)
Finance	JBIC
Period	September 2007 - August 2008
Type of Project	Special Assistance for Development Policy and Projects (SADEP)

Project Outline

Assessment reports on climate change impacts prepared by the Intergovernmental Panel on Climate Change (IPCC) show that global warming will likely progress further in this 21st century. Our society recognizes that climate change is the most critical issue in the centuries to come and we have to tackle this issue through reduction of greenhouse gas emission and adoption of appropriate measures on a global basis.

In particular, the most complex effects of global warming may take place in the mega cities, directly such as frequent occurrence of drought and flooding, and indirectly such as relocation of people and malfunctioning of infrastructures due to frequent occurrence of natural disasters. In order to adopt suitable and effective countermeasures, precise assessment on the effects and factor analysis are indispensable in the first instance.

Especially along the coastal areas in Asian countries, increase of the number of large cities and expansion of the existing large urban areas could be expected in line with their economic growth. Thus, it is imperative to clarify the possible effective measures in each area and to propose the significant roles of ODA to the international society through the precise assessment on effects and factor analysis. The study was carried out through the cooperative effort and partnership of JBIC, WB and ADB. The tasks assigned to JBIC are: (1) to undertake the quantification of climate change in terms of incremental ratio of rainfall; and (2) to conduct a case study for Metro Manila, the Philippines, one of the coastal mega cities in Asia.

Details

Three project areas of Pasig-Marikina River basin, West of Mangahan and KAMANAVA drainage areas, in which the yen-loan projects had/have been conducted, were selected as the target study areas.

Target year was set in 2050 as a halfway mark of IPCC SRES, which projected global climate change in 2100, and a realistic period in projection. It could be assumed that 50 % of the changes of sea level rise projected in 2100 will occur in 2050, while the relation between temperature rise and rainfall increase could be set through downscaling technique and regression analysis based on the IPCC projected values. This part was assisted by IR3S, University of Tokyo.

Based on the above relationship by the future scenarios, the hydrological and hydraulic simulation was made to clarify the hydrological effects of global warming. The storm surge part was assisted by Ibaraki University. Significant increase of flooding areas and depths was computed in accordance with progress of the global warming.

Recommendations

The study approach could be applied to the other Asian coastal mega cities in broad terms. In details, however, should be established the following methodologies for future studies/researches; (1) to project rainfall changes in short (hourly and daily) and long (monthly and annual) durations in specific river basins or regions, and (2) to analyze the future changes in water resources development potentials as well as floods in the above river basins or regions.

Project Accomplishments by AJCE Members

THE PROJECT FOR CONSTRUCTION OF RAILWAY FLY-OVER IN ULAANBAATAR CITY IN MONGOLIA

Principal Firm(s)	CTI Engineering International Co., Ltd
Project Site	Ulaanbaatar City in MONGOLIA
Client	Japan International Cooperation Agency (JICA)
Finance	JICA
Period	March 2008 - December 2008
Type of Project	Basic Design Study

Project Outline

The Project is planned to construct 895 m long new road including 265 m long railway flyover connecting Ikh Toyruu / Narny Zam to Engels Street in the center of Ulaanbaatar.

Ulaanbaatar City (hereinafter called as UB) is a capital and also hub of economic and political sector of Mongolia. Population of UB reaches more than 994 thousand (38.3 %) in 2006, and UB-GRDP of 1,730.0 Billion Tg. accounts for 54.5 % of national GDP of 3,172.4 Billion Tg. in 2006. The railway, one of the most important logistics means for economic sector, is passing in the center of UB and it disrupts road traffic and land-use into two parts.

The government office, business and trade centers as well as residential area are mainly concentrated in the northern part, and more than 70% of citizens live in the northern part. The southern part has been developed as a major industrial area that produces important export and domestic consumable goods such as cashmere, leather products, garment, construction material, beverages products and etc.; it earns more than 60% of national GDP. UB Government decided to develop as new residential area whose scale is for 72,000 residents as well as new industrial having modern equipment and technology in their new development master plan by 2020.

Therefore, a new access route connecting to this area from the north are which is center of UB is required to contribute towards an improvement of the socio-economic sector.

Details

The Project intends to construct a Railway Fly-over connecting between northern and southern areas of Ulaanbaatar City and aims to ensure the safe and smooth traffic of roads between northern and southern areas of Ulaanbaatar city, which are divided by the railway tracks.

The Project has the following components and the scale of works:

(1) Construction of Bridge:
- Bridge length: 262 m
- Number of traffic lane of bridge: 4 lanes (2 lanes each way)
- Total width of bridge: 16.5m (dual carriage way (3.25@2+0.75) @2=14.5m, median strip 1.0 m, parapet 0.5 m@2=1.0m)
- Sidewalk of bridge: 1.5m at each side
- No. of abutments/piers: 2 abutment and 4 piers

(2) Construction of Approach Roads

1) to Ikh Toyruu
- Road length: L= 279 m
- Number of traffic lane: 4 lanes (2 lanes each way)
- Width of road: 17.0 m
- Sidewalk: 2.5m at each side

2) to Engels Street
- Road length: L= 354 m
- Number of traffic lane: 4 lanes (2 lanes each way)
- Width of road: 20.0 m
- Sidewalk: 6.0 m at each side
- U-turn road: L= 580 m

3) to Narny Zam
- Road (for channelization) length: Eastern side L= 205 m, Western side L= 181 m, totaling L= 386 m
- Number of traffic lane: 1 lane for each direction
- Intersection: two channelized intersections controlled by traffic signal

A Bird's-eye View of Railway Flyover

Project Accomplishments by AJCE Members

Malaysia Sewage Treatment Plant Project - Pantai Sewage Treatment Plant and Network

Principal Firm(s)	NJS Consultants Co., Ltd. ERINCO Sdn. Bhd.
Project Site	Kuala Lumpur, Malaysia
Client	Sewerage Services Department, Ministry of Energy, Water and Communications, Government of Malaysia
Finance	Japan Bank for International Cooperation (JBIC) and Government of Malaysia
Period	April 2001 - March 2008
Type of Project	• Project Evaluation /Preliminary Design • Detailed Engineering Design • Tender Assistance • Construction Supervision • Operation and Maintenance Training • Technology Transfer

Bird's-eye View of Pantai Sewage Treatment Plant

Project Outline

- To review the existing sewerage system and treatment provided for the central area of Kuala Lumpur and develop a design to upgrade and expand the existing system to cater for increased population and more stringent effluent standards.
- To develop design standards for mechanized treatment systems suitable for the local conditions.
- To conduct prequalification of contractors, assist in tender evaluation and contract award
- To supervise the construction of the new facilities and provide training during commissioning and plant operation.

Details

The major outputs through the project are:

- Activated sludge treatment plant at Pantai serving a population equivalent (PE) of 377,000 producing a final effluent BOD of below 20 mg/l and dewatered digested sludge with minimum 20% dry solids. The facility also treats imported sludge from an additional 320,000 PE generated in communal treatment plants and septic tanks.
- Pantai Trunk Sewer connecting the centre of Kuala Lumpur to Pantai constructed by TBM with diameter 2.5 to 2.8 m and 5.4 km long delivering sewage to the inlet Pump Station sized for the ultimate flow from 1.8 million PE.
- New trunk sewers to serve rapidly developing suburban areas with a total length of 13.3 km and diameter 1.8 m.
- The new system has greatly reduced the overflow of raw sewage to the river systems during heavy rain and reduced the pollution load discharged to the River Klang.
- The total construction cost of the Pantai project is of the order of Malaysian Ringgit (MR) 570 million.
- The Pantai Project represents one of 13 sub-projects designed and constructed under the Malaysia Sewage Treatment Plant Project. The Project is designed to upgrade sewage and sludge treatment systems in critical urban areas in Peninsular Malaysia and provides sewage treatment for 1.7 million PE plus sludge treatment facilities for 1.9 million PE over and above the sludge generated in the sewage treatment plants.
- The Project is funded under a JBIC Loan of Yen 48,489 million and the total Project cost is estimated to be of the order of MR 2,000 million.

Project Accomplishments by AJCE Members

New Environmentally-friendly Subway Station

CFD analysis of predicted air flow of a subway station heat exhaust by Natural ventilation

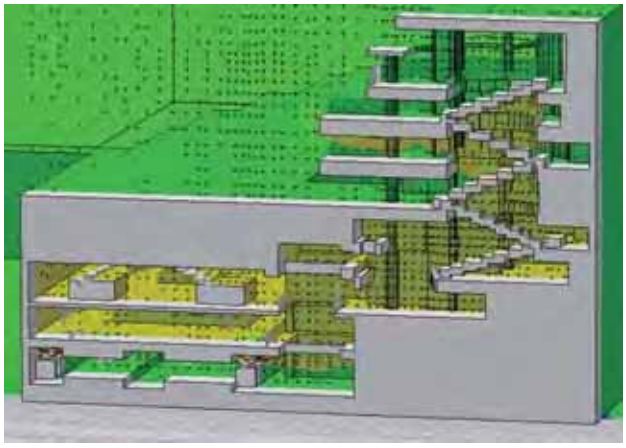
Principal Firm(s)	Tokyu Architects Engineers Inc. P.T. Morimura & Associates, Ltd. P.T.MORIMURA & ASSOCIATES
Project Site	Tokyo, Japan
Client	Japan based railway companies
Finance	Japan based railway companies
Period	2006-2008
Type of Project	Feasibility Study (CFD verification of surplus heat exhaust by natural ventilation in station)

Project Outline

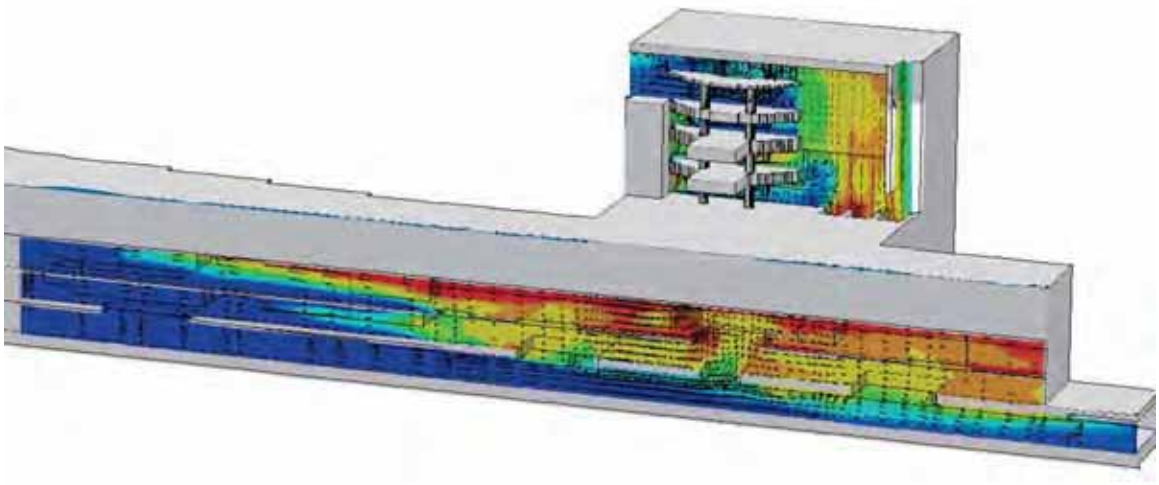
- In a typical subway station enormous use of electric power is necessary to discharge exhaust heat from air-conditioning and trains by mechanical ventilation.
- Under the new construction plans for this subway station, the basic concept was the introduction of natural ventilation to effectively discharge the heat generated in this underground space.
- As a new environmentally-friendly subway station, this model station building will realize energy savings.

Details

- The plans for the station include atriums from the ground floor down to the Basement 3 platforms in 3 locations and the hot air from the Basement 3 shall be exhausted by natural ventilation.
- Cold fresh air flowing into the underground space shall be introduced into the tunnels.
- The planned atriums were modeled using CFD to provide verification of the indoor environment within the underground station, such as room temperature and ventilation volume.



Station CFD model (transverse cross-section)



Station CFD model(longitudinal cross-section)

Project Accomplishments by AJCE Members

Sondu/Miriu Hydropower Project, Kenya

Principal Firm(s)	Nippon Koei Co., Ltd. NIPPON KOEI Challenging mind, Changing dynamics
Project Site	Nyanza Province, Kenya
Client	Kenya Electricity Generating Company Ltd.
Finance	Kenya Electricity Generating Company Ltd. /Japan Bank for International Cooperation
Period	1990 - 1991 and 1997 - 2008
Type of Project	♦Detailed Design and ♦Construction Supervision

Project Outline

- ♦A run-of-river type hydropower station was constructed on the Sondu River in the Lake Victoria basin, which was formulated in the multipurpose development master plan of the Sondu River by JICA in 1985.
- ♦The power generated at the powe station is transmitted to the national grid via Kisumu substation.
- ♦The construction was commenced in March 1999 and completed in March 2008.

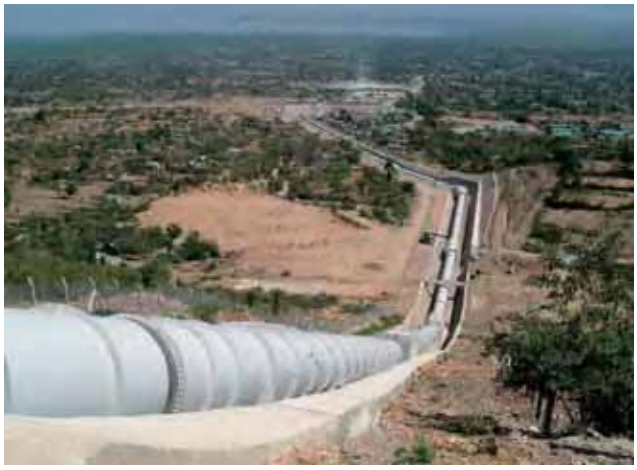
Details

The Project features are as follows:

Plant discharge	40 m3/sec
Gross head	197 m
Installed capacity	60 MW
Annual energy	331 GWh
Intake weir	70 mW, 65 mL, 18 mH
Headrace tunnel	4.2 mD, 6.3 kmL
Surge tank	14 mD, 36.8 mH
Steel penstock	3.6 mD, 1.2 kmL
Powerhouse	25 mW, 40 mL, 32 mH
Turbine/Generator	30 MW, 2 units
Outlet channel	9.6mW at top, 4.7 kmL
Transmission line	132 kV, 50 kmL

(Note; W: wide, L: long, H: high, D: in diameter)

Intake Weir and Intake



Steel Penstock Line and Power house

Water Point along Outlet Channel

Project Accomplishments by AJCE Members

Toyoshima Bridge Project, Japan

Principal Firm(s)	CHODAI Co., Ltd.
Project Site	JAPAN
Client	Hiroshima Prefecture, Hiroshima Prefecture Road Corporation
Finance	Hiroshima Prefecture + Government of Japan
Period	2002-2008
Type of Project	♦Detailed Design ♦Construction Supervision

Project Outline

♦Toyoshima bridge will form a part of the bridge family which links several islands and connects to the main land in Hiroshima Prefecture, Japan.

♦Toyoshima bridge consists of a single span suspension bridge with the span of 540m, 3-span continuous steel plate girder bridge on the west, and 4-span continuous steel box girder bridge on the east.

Details

Basic data of the bridge:

♦Bridge Length: 903.2m
♦Roadway Width: 8.5m
♦Tower Height: 108m
♦Design Vehicle Speed: 50km/hr

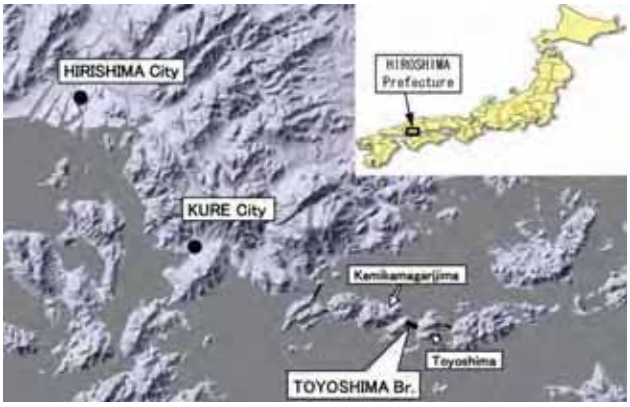
Special features of the suspension bridge:

♦"In-tact rock anchorage" is adopted to minimize the impact of the anchorage construction on the environment.

♦Vibration (vortex shedding oscillation) of the tower is, without additional devices, controlled by the friction of sliding bearings provided on the tower cross beam to support the side span girder.

♦7mm diameter steel wire, instead of 5mm wire normally used, is adopted to the main cable constructed by means of aerial spinning to minimize the construction period and cost.

♦Horizontal plates (not edge fairings) are attached to the sides of the suspended single box girder to stabilize the aerodynamic behavior of the girder.



Location Map


View from Toyoshima Island


View on the Bridge

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Members of Publicity & Relations Committee and AJCE staffs are enjoying cherry-blossom viewing party at nearby UENO Park. Cherry blossom lasts only for a few weeks, however, it flourish our spirit full of joy and happiness. Hope you can visit us in the cherry blossom season. Illustration, Miho Yamato, Publicity & Relations Committee

Editor's note

AJCE issues three Japanese News Letters for the domestic readers and one English News Letter for the overseas readers each year. English News Letter includes article by guest editor, AJCE activities in 2008 such as annual seminar, Young Professionals Exchange Program (YPEP2008) and project accomplishments by member firms. These articles are aimed especially at the overseas MAs and CEs.

In the topic, Dispute Adjudication Board (DAB) is introduced. Writer, Dr. Toshihiko Omoto, professor of Kyoto University, is a sole FIDIC president adjudicator in Asia. Last year, a study to promote adjudicators in Asian region was implemented under JBIC project. Seminars were held in Japan and overseas in collaboration with JBIC and FIDIC member associations, CECOPHIL (Philippines) and CEAI (India). Large number of participants underscored the keen interests in this topic. Action plan for the promotion of DAB was introduced at ASPAC General Assembly Meeting during 2008 FIDIC Quebec conference.

Also, AJCE president Mr. Hirotani, who is concurrently the chairman of ASPAC, presented prefatory notes. Starting from the subprime loan issue that led to the global economy becoming turbulent, each developed country created policies to lesson the downturn trend in their respective economies. FIDIC made the announcement that "We hope to demonstrate that consulting engineers are indeed leaders and trusted advisors to society for the creation of safe and sustainable build & natural environment". Further, it can be said that the establishment of "A Strong Industry Serving Society" is needed, the precise topic featured at 2008 FIDIC Quebec conference.

I would like to thank not only the members of Publicity and Relations Committee but also AJCE secretariat, Yoshi Yamashita and Saki Tomita for their assistance in the course of News Letter preparation and publication. Especially we thank our readers for their continued interest in the News Letter.

Ichiro Seko, Chair, Publicity and Relations Committee

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AJCE Members
46 firms, 164 members, 8 supporting members

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Masaru Kaido
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Yoshiko Koizumi
Yoichi Takemura

History of AJCE

1974 Establishment
Joined as FIDIC Member Association
1991 FIDIC annual conference in TOKYO
2004 Celebrated the 30th anniversary

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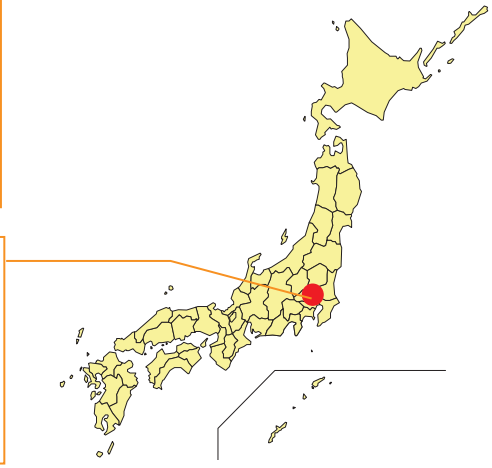

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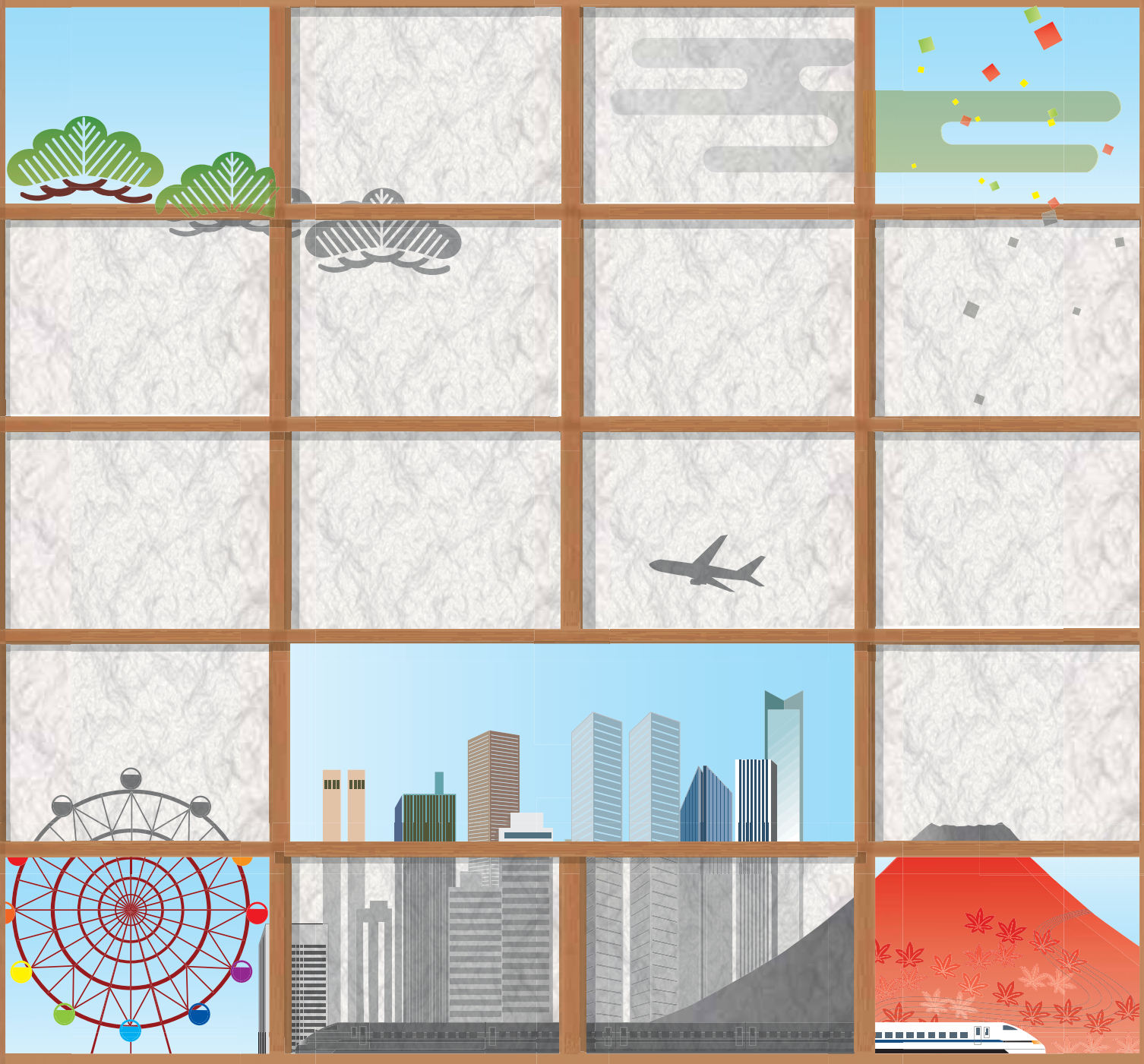
FIDIC Member Association



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