MAA Bulletin

ISSUE 47-48
JULY 2010

Natural Disasters in Taiwan

亞新工程顧問（集團）公司
MAA Group Consulting Engineers
BANGKOK BEIJING HONG KONG KAOHSIUNG
SHANGHAI SINGAPORE TAIPEI

Integrated Solutions For Global Impact

MAA GROUP

MAA Bulletin

Issue 47-48 July 2010

Founded in 1975, **MAA** is a leading Asian engineering and consulting service provider in the East and Southeast Asian region focused in the areas of infrastructure, land resources, environment, buildings, and information technology.

To meet the global needs of both public and private clients, MAA has a full range of engineering capabilities to provide clients with integrated solutions - ranging from conceptual planning, general consultancy, engineering design to project management.

Today, MAA has 800 people with companies in the Greater China Region (Beijing, Hong Kong, Shanghai, Taiwan), Mekong Region (Bangkok), and Southeast Asia Region (Singapore), creating a close professional network in East/Southeast Asia.

MAA's goal is to establish engineering capability that will meet local needs. Along with the changes in social-economic environment over the years, MAA's business philosophy is to provide professional service that will become an asset to clients with long lasting benefits. **ASSET** represents five key components that underlies MAA's principles of professional service

project
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Economical Solution
Timely Completion

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MAA AND SUSTAINABLE DESIGN

EXTREME EVENTS AND DISASTERS

In recent years, the world is experiencing an increasing number of serious issues, including rapid urbanization, alarming rate of natural resource consumption, financial and economic turmoil, severe climate changes and unforeseen scale of natural disasters. In a short one year period, record breaking natural disasters such as earthquakes, floods, droughts, fire, landslides, sandstorm and volcano eruption occurred in many parts of the world. A few examples include the 8.0 magnitude earthquake in Chile that a NASA scientist observed to have tilted the earth's axis; the two hundred year worst 7.0-magnitude earthquake in Haiti in January 2010; record 30 cm of rain in 24 hours in Northwest England in November 2009; record breaking 63 cm snowfall in Moscow in early 2010; August 2009 catastrophic 88 inches major snow "hurricane" in 50 years in New York and New England area in February 2010; devastating snowfall in northern and central China in November 2009; worst drought in 1000 years in Australia; 50 year worst drought hitting 12 provinces in China in the beginning of 2009; Icelandic volcano, which has been dormant for 200 years, erupted causing more than 95,000 flights cancellations in 6 days.

Topography of Taiwan

Taiwan is one of the few areas in the world that suffers from frequent natural disasters such as landslides, typhoons and earthquakes. This is because Taiwan is not only located on the major tracks of typhoons in the northwest of the Pacific area, but is also situated on a complex tectonic area between the Yangtze Plate to the west and north, the Okinawa Plate on the north-east, and the Philippine Mobile Belt on the east and south. Taiwan, formed from the tectonic activities, has a complex topographical formation, fragile geology, loose surface soil and rushing rivers. Two-thirds of the 35,801 sq. km. island is covered by mountainous terrain, nine tenth of the island is rated by USGS's hazard map as "most hazardous," and the amount of usable water per person is less than 1/6 of the global mean due to inhomogeneous distribution of precipitation. Annually, 3 to 4 typhoons sweeps through the island during which landslides almost always occur, an average of 18,500 earthquakes strikes every part of Taiwan of which 1,000 earthquakes can be felt. In the last decade, Taiwan is also one of the victims to extreme events and natural hazards. In 1999, the 921 Chi-Chi earthquake is a hundred year strong quake devastated central Taiwan. In August 2009 the Morakot Typhoon in Taiwan with record breaking rainfall of 3,095 mm in three days caused severe damages in Southern Taiwan (see Page 8), and the worst sandstorm in Taiwan history swept the island in March 2010.

The increasing frequency of natural hazards around the world is challenging every part of society to provide sustainable development solutions. Without exception are civil engineers' roles to continue to provide the necessary solutions to maintain the quality of life of all societies. These solutions include minimizing devastating impacts from extreme events, avoid wasteful energy usage, speedy assistances to recovery from natural disasters, provide clean water, minimizing pollutions, and adhering to professionalism in all the designs civil engineers provide, etc.

MAA'S SUSTAINABLE DESIGN

In recent years, Taiwan is one of the active areas in the world that promotes the policy of "energy efficiency and carbon reduction," and the principle of "the coexistence and co-prosperity of men and environment" in public and private infrastructure developments. Due to the natural hazardous environment of the island, practicing civil engineers in Taiwan have been challenged by the threats of natural hazards in their designs ever since the economic "miracle" period of 1970s and 1980s. In recent years, the government has further dedicated the efforts in promoting sustainable development of the nation by implementing policies for green construction, ecological engineering, and green building, and encouraging the usage of the renewable energy, increasing the variety of energy types and improving the environment.

MAA is fully committed to play a major role in supporting the policies by the government and dedicates to develop the related technologies to promote renewable energy, green building, green construction, ecological engineering, etc. Naturally trained by the varying and complex geological characteristics in Taiwan, MAA will continue her contributions in hazard mitigation efforts and post hazard relief efforts and environmental related works. The following are recent examples of MAA's efforts in sustainable design.

GREEN BUILDING, GREEN CONSTRUCTION, ECOLOGICAL ENGINEERING

- Taipei MRT Circle Line Phase I Contract DF113 Detailed Design, Taiwan
  - *building integrated photovoltaic (BIPV) system; Wind power application, mechanical bicycle parking tower, self-compact concrete (SCC)application.*

- 臺北縣中港大排汙染改善暨河廊環境營造工程
  - *Environmental improvement construction*

Taipei MRT Circle Line

- Taipei MRT Tucheng Line Extension to Dingpu Lot DD170 Detailed Design, Taiwan
  - *Energy saving index (concourse eye design)*

- 「高雄市現代化綜合體育館民間參與開發」施工階段委託專案管理技術服務
  - *Building integrated photovoltaic (BIPV) system*

- 國立台灣戲劇藝術中心興建工程委託專案管理技術服務
  - *Green building energy saving index, water preservation index*

- High Speed Rail Interchange with East-West Expressway - Jhangbin to Taichung Section, Taiwan
  - *Ecological Engineering Planning and Design of Fahzih Creek Embankment*

CONSTRUCTION WASTE CLASSIFICATION & TREATMENT

MAA has considerable experiences in waste disposal particularly in the waste treatment and classification. The most representative case is the first national waste classification and re-use project, Construction Waste Classification & Treatment of Nankang Economic and Trade Park in Taipei City. MAA introduced the latest international technology and equipment to complete the classification and utilization successfully that also became the model of domestic waste classification. Another important case was the largest waste classification and re-use plan in Taiwan, the Turnkey Project for Nei-Hu Solid Waste Dumpsite Clean Up. The total clean up volume estimated at about 3,120,000 m^3, and the first phase is expected to be completed in 2012 with volume of 2,228,000 m^3.

GEOLOGICAL HAZARDS, LANDSLIDE-DEBRIS FLOW INVESTIGATIONS

Year	Project Name	Major Typhoon Event
2010	Mapping of Geological Hazards in Higher Mountainous Areas in Southern Taiwan	Morakot, Jangmi, Kalmaegi
2009	Mapping of Geological Hazards in Higher Mountainous Areas in Northern Taiwan	Parma
2008	Mapping of Geological Hazards in Higher Mountainous Areas in Central Taiwan	Sinlaku, Kalmaegi (Chi Chi Earthquake)
2007	Mapping of Geological Hazards in Higher Mountainous Areas in Central-Southern Taiwan	Sepat, Bilis, Longwang (Chi Chi Earthquake)
2010	Geological Investigation, Landslide-Debris Flow Investigation and Their Susceptibility Evaluation in the Danshuei , Lanyang and Nankan Rivers Watershed Area	Parma
2009	Geological Investigation, Landslide-Debris Flow Investigation and Their Susceptibility Evaluation in the Kaoping , Donggang and Jhihben Rivers Watershed Area	Morakot, Jangmi, Sinlaku
2008	Geological Investigation, Landslide-Debris Flow Investigation and Their Susceptibility Evaluation in the Toucian, Jhonggang, Houlong, Fongshan and Wu Rivers Watershed Area	Sinlaku, Kalmaegi (Chi Chi Earthquake)
2007	Geological Investigation, Landslide-Debris Flow Investigation and Their Susceptibility Evaluation in the Tahang, Tachia, Chuoshui, Huwei and Potzu Rivers Watershed Area	Sepat, Bilis, Longwang (Chi Chi Earthquake)
2003-2007	Integrated Environmental and Engineering Geologic Database System on Web-Site	
2006	The Studies and Investigation on Geological Hazard of Slopeland in Eastern Taiwan	Bilis, Longwang
2005	The Studies and Investigation on Geological Hazard of Slopeland in Taiwan at Taoyuan, Miaoli, Yilan Area	Haitang, Aere
2004	The Studies and Investigation on Geological Hazard of Slopeland in Southern Taiwan	Mindulle, Aere
2003	The Studies and Investigations on Geological Hazard of Slopeland in Central Taiwan	Nari, Toraji, Xangsane, Herb (Chi Chi Earthquake)
2002	The Studies and Investigation on Geological Hazard of Slopeland in Northern Taiwan	Nari, Toraji, Xangsane, Zeb
2010	Safety Investigation for Mountainous Villages in Typhoon Morakot Disaster Area	Morakot

Morakot Typhon damages in Kaohsiung County

Chi Chi Earthquake caused severe damages in Nantou County

HYDRO-ELECTRICITY GENERATOR PATENT

Innovations of renewable energy within the civil engineering sector has increased dramatically due to the promotion of energy saving and carbon reduction solutions around the world. In January 2010, MAA received the patent (No. M374506) for the Hydro-Electricity Generator. The special characteristic of the invented device is the specific usage and assembly in water storage tanks. The mechanism is the use of gravitational energy to rotate the microturbine to generate electricity whenever waterflow is induced in the building/facility. The Hydro-Electricity Generator includes a compressing tube, a pivoted hydro-electricity turbine in the compressing tube, and a guiding bracket with an opening for holding the compressing tube. When water flows in the water-storage tank, the guiding shelf guides the flowing water towards the compressing tube, during which the compressing tube accelerates the flow of water. The water then rotates the hydro-electricity turbine to generate power. The research for the device was led and adviced by Prof. Hsin, C.Y.(辛敬業), a MIT PhD majoring in Fluid Dynamics and a Professor of National Taiwan Ocean University, and with MAA's former Senior Vice President Dr. Chung-Tien Chin and senior engineer Mr. Chia-Yen Chao, with the support from current Vice President Mr. Chen-Hui Hsieh and Electric & Mechanical System Department Manager Mr. Kuang-Ping Chen.

中華民國專利證書

新型第 M 374506 號

新型名稱：於儲水容器中裝設水力發電機組件之水力發電設備

專利權人：亞新工程顧問股份有限公司、辛敬業

創作人：辛敬業、秦中天、趙嘉彥

專利權期間：自2010年 2 月21日至2019年 8 月26日止

上開新型業依專利法規定通過形式審查取得專利權
行使專利權依法應提示新型專利技術報告進行警告

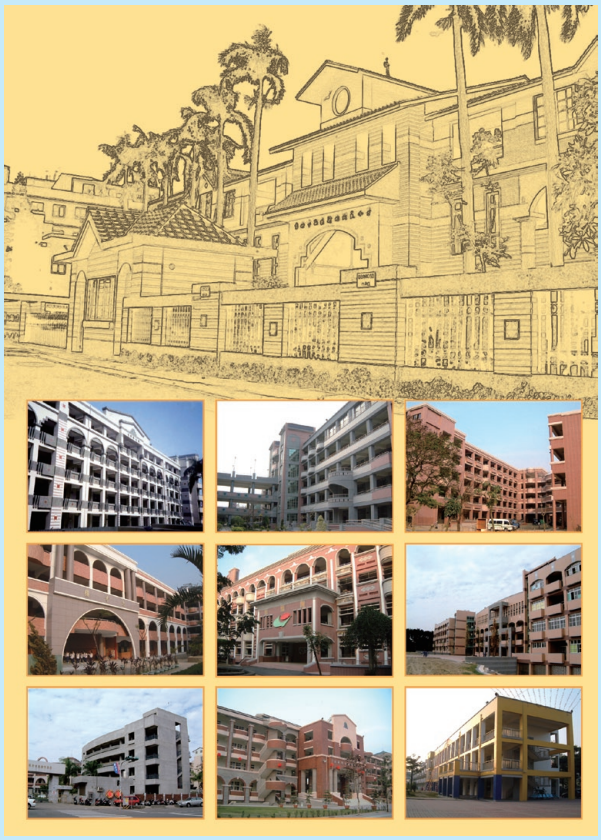
經濟部智慧財產局

局長 王美花

中華民國 99 年 2 月 21 日

Hydro-Electricity Generator Patent

POST 921 EARTHQUAKE RECONSTRUCTION OF PRIMARY SCHOOLS



Post 921 Earthquake Reconstruction of Primary Schools

Ten years after the catastrophic 921 Chi-Chi Earthquake that struck central Taiwan on 21st September 1999, students of the 22 primary and junior high schools in Yunlin County, Chiayi County, Chiayi City, Tainan County and Tainan City have safely continued the usage of their rebuilt buildings. In these reconstruction projects, MAA Taiwan was engaged by the Ministry of Education to provide project/construction management services including program development, selection of architects, construction tender process, contract management and quality assurance. MAA delivered the services successfully to the total of 164,000 m^2 scattered sites under tight schedule and access roads. MAA received Certificates of Appreciations from all the schools administration for the careful planning and intensive project management of the reconstruction.

WUHAN – GUANGZHOU PASSENGER DEDICATED LINE

WUHAN-GUANGZOU HIGH SPEED RAILWAY

The 968 kilometer Wuhan-Guangzhou Passenger Dedicated Line (PDL)was officially launched on 26th December 2009 after a short four years of construction. The launch of Wuhan-Guangzhou high speed passenger dedicated rail marked a significant achievement among key second and third tier cities of Hubei and Hunan Provinces from Wuhan City to Guangzhou City of the Pearl River Delta economic center of Southern China. The Pearl River Delta, which comprises of nine perfectures of Guangdong province (Guangzhou, Shenzhen, Zhuhai, Dongguan, Zhongsan, Foshan, Huishou, Jiangmen and Zhaoqing) and SARs of Hong Kong and Macau, is the most economically dynamic region of China since China's reform program in 1979. The line is part of the planned 2100 km high speed railway line from Beijing to Guangzhou. It is currently the world's fastest train service, averaging 313 kilometers per hour (with a maximum design speed of 350 km/hr). The line has shortened travelling time from Wuhan City to Guangzhou City to three and a half hours from the previous service of ten and a half hours. Two thirds of the entire length of the railway line is comprised of bridges (468 km) and tunnels (177 km). There are a total of eighteen stations of which fourteen are for passenger services.

Map of the Wuhan-GuangZou High Speed Railway

Wuhan-GuangZou High Speed Railway

MAA International, as a member of the consortium of Dutch company ARCADIS and local Chinese design institutes, has been awarded in January 2006 the contract for construction supervision for the 247.5 km long section of the PDL from Wuhan City in Hubei province to Hwadu City in Guangdong province. The project passes through Xianning, Yueyang, Changsha, Chuzhou, Hengyang, Chenzhou, Shaoguan and Chingyuan cities and towns. The project includes 142 bridges with a total length of 97.315 km and 73 tunnels with a total length of 90.17km (17 tunnels over 1000m), 102km elevated rail, 551km electric cable, 682km communication fiber cable and 4 newly built stations in Lechang, Shaoguan, Yinde and Chingyuan. In addition to construction supervision works, MAA played a key role as the coordinator between the foreign partner and the local Chinese design institutes and client.

Source:

http://big5.citygf.com/news/News_001011/200910/t20091009_129627.html

http://big5.ce.cn/xwzx/gnsz/gdxw/200912/27/t20091227_20696365.shtml

http://en.wikipedia.org/wiki/Wuguang_Passenger_Railway

DONATIONS

COMMUNITY/LIBRARY CENTER AND REBUILDING OF BAAN RA ZAI (DEN PATTANA) PRIMARY SCHOOL, BAAN RA ZAI VILLAGE, SURIN PROVINCE, THAILAND

Classroom Picture Before Reconstruction

Classroom Picture After Reconstruction

In the beginning of 2009, Managing Director Dr. Tian-Ho Seah of MAA Geotechnics initiated a library development program for primary schools that received limited assistances from the government in rural Thailand. Baan Ra Zai Primary School, located in the famous elephant area, Surin Province was selected based on the urgency of the need, the poor condition of the school, and the commitment of the school director.

The school, established 31 years ago with an area of around 13,000 square meters, offers kindergarten level 1 to Primary 6 education for the villagers in the area and currently has 39 students. Under the request from the villagers, the intended library building was converted to a community center so that the villagers (the relatives of the schoolchildren) could also use the building for village meeting, information gathering center. MAA Geotechnic's business partners also extended the contribution efforts to Community Center development through the donations of books, furniture for the center, computers with internet service, additional toilets as well as scholarships for students in need. The major contributors include: MAA Geotechnics Co., Ltd. and GS Engineering & Construction Corporation. Other contributors include: Geoplast Co. Ltd., CeTeau FarEast Ltd., Thai Piling Rig Co., Ltd., Staff of Moh and Associates Inc., Staff of GS E&C, Mr. S.J. Kang of GS E&C, Mr. Fred Gregory, Mrs. Pacharaporn Boonpeach and Mr. Christian Leonard Hoelblinge.

The Community/LibraryCentre was named in honour of Mrs. Diana Moh who passed away on the 3rd February 2007. Mrs. Moh was the wife of the Founder of MAA Group, Dr. Za-Chieh Moh. On 19th August 2009, the opening ceremony was held with the attendance of Dr. Za-Chieh Moh and his family along with Deputy Governor of Surin Province Mr. Sushep Khangkhun, Area Officer of District 1 Education Mr. Sumroeng Bunto, School Director Mr. Pichet Jindasri, Village Head Mr. Somsri Charddaeng, and the people of the village.

During the ceremony, Dr. Za-Chieh Moh and his family made an additional donation to the rebuilding of the school after learning the poor condition and the frequent flooding that occurred at the school.

Opening Ceremony of Community/Library Center Baan Ra Zai Primary School

88 MORAKOT TYPHOON

On 8th August 2009, Typhoon Morakot thundered Taiwan with a record breaking 3,095 mm rainfall accumulation, which brought severe flooding, landslides, and catastrophic damages of more than USD 3.3 billion, leaving 699 people dead and missing. In some areas, the amount of rainfall in the three days dumped by Morakot amounted to 70% of the annual precipitation. The worst damaged area was in Southern Taiwan where an entire village, Xiaolin Village was instantaneously covered by a massive mudslide burying alive more than 400 people. Schools, public facilities, roads and bridges were destroyed, cutting off access paths to damaged high terrain areas. As an effort to provide relief to the victims of the "88 Disaster," MAA Taiwan and many of the staff have collectively put in donations to Kaohsiung County Government on 27th August 2009 to support the rescue actions.

QINGHAI EARTHQUAKE

On 14th April 2010, the largest earthquake of a magnitude of 6.9 in fifty years struck the residents of China's remote Yushu County, located on the Tibetan plateau. Immediately following the tremor came the collapse of thousands of wood-earth buildings and heavy damages and destructions of large structures in the town of Gyegu and the adjacent villages. Due to the high elevation and limited road connections, rescue missions had extreme difficulty to reach the remote region on time. Chinese state media reported the death toll amounted to more than1,144. MAA Taiwan staff, initiated by Mr. Ben Lin, expressed their concern for victims in Qinghai and have collectively put in donations to the Eden Social Welfare Foundation for supporting orphanage schools in Yushu County

88 Morakot Typhoon

Source: http://www.boston.com/bigpicture/2009/08/typhoon_morakot.html

NOTICES

NEW APPOINTMENTS – MAA TAIWAN

Effective on 1st February 2010, the following are the new appointments of key staff in MAA Taiwan:

PERSON	DEPARTMENT	TITLE
Mr. Richard MOH		Corporate Development Senior Vice President
Mr. Yung-Her HUANG		"Overseas Business Development " Vice President
Mr. Chen-Hui HSIEH		"Engineering Design" Vice President
Mr. Shih-Chang HUANG		"Construction Supervision & Management" Senior Manager
Mr. Chin-Der LIN	Environmental & Water Resource Eng. Dept.	Senior Manager
Mr. Ting-Chiun SU	Geotechnical Engineering Dept.	Senior Manager
Mr. Chien-Chung HUANG	Geomatics Dept.	Senior Manager
Mr. Shaw-Wei DUANN	Transportation and Civil Eng. Dept.	Senior Manager
Mr. Shao-Kuei CHEN	Project & Construction Management Dept.	Manager
Mr. Ben Pen-Chi LIN	Construction Supervision Dept.	Manager
Mr. Shyan-Ching JANG	Structural Engineering Dept.	Manager
Mr. Kuang-Ping CHEN	Electric & Mechanical System Eng. Dept.	Manager

MAA BEIJING NEW ADDRESS

In May 2010, MAA Beijing moved to the following new address:

MAA Engineering Consultants (Beijing) Co., Ltd.
Room 809-810, GuoTou Plaza, No 7 Fu Wai Street Xicheng District, Beijing 100037, China.
北京市西城区阜外大街7号国投大厦 809-810室
Tel: (86-10)6836-3461 Fax:(86-10)6836-3460 E-mail: maabeijing@163.com

Selected Projects-1st May 2009 to 30th April 2010

INDEPENDENT SAFETY AND RELIABILITY CERTIFICATION ENGINEER FOR THE SUVARNABHUMI AIRPORT RAIL LINK AND CITY AIR TERMINAL PROJECT

For the convenience of air passengers to and from Bangkok, the State Railway of Thailand decided to provide an express railway service connecting downtown Bangkok City Air Terminal in Makkasan area and the new Suvarnabhumi International Airport. The link will be approximately 28 km long with 8 stations and have a maximum design speed of 160kph. The rail track will be elevated for most of its route with short at-grade and underground sections at Suvarnabhumi Airport. The railway corridor will include commuter services due to the many residential areas along the railway alignment. Express journeys will take 15 minutes and commuter trips will take 27 minutes. Construction started in 2005 and is expected to be in operation at the end of 2009. In April 2009, SRT engaged the consortion of PB (Asia), Poyry Infra and MAA Thailand for the independent safety and reliability certification engineer service.

The Suvarnabhumi Airport Rail Link and City Air Terminal Project

BANGKOK MRT PURPLE LINE: BANG YAI- BANG SUE SECTION

In December 2009, MAA Thailand, as part of the consortium, was engaged by the Mass Rapid Transit Authority of Thailand (MRTA) to provide Project Consultancy services for Bangkok's MRT Purple Line Bang Yai to Bang Sue Section. The section is a 23 km elevated heavy rail transit system with 16 elevated stations, a depot with operation control center and four park and ride facilities. The route begins at Khlong Bang Phai and terminates at Tao Poon T-juntion. The project includes the connection between Tao Poon terminal station and Bang Sue Station of the existing Chaloem Rathamongkol Line (Blue Line), along the Prachara 2 Road. MAA Thailand's scope of service includes providing technical advises and recommendations for the construction of elevated structure, station structure, track work, conductor rail system; building service systems of the station and buildings, and railway systems; supervision and inspection for compliances of construction work including installation of track, conductor rail and electric train associated systems; and inspection of the acceptance tests for the installations and commissioning of installed systems.

The MRT Purple Line Project, Bang Yai- Bang Sue Section

FEASIBILITY STUDY AND PRELIMINARY DESIGN OF DOUBLING TRACK SYSTEM FOR TRANSPORT AND LOGISTICS MANAGEMENT (PHASE I)

The current railway network of Thailand comprises of 4,044 km single line track and 143 km. and 107 km. double track and triple track, respectively. The current network is quickly reaching its capacity and with growing demands, the State Railway of Thailand (SRT) has decided to increase additional tracks.

The State Railway of Thailand

The Office of Transport and Traffic Policy and Planning (OTP) under the Ministry of Transport, therefore, is conducting the Phase I planning for the extension of double track system and a review and improvement of the transport and logistics management. Specifically, the phase I study includes:

- 400 km. track doubling development.
- 80 Stations improvement.
- Signaling and telecommunication improvement.
- 500 locations of road crossing improvement.
- New ICD and 8 container yards development.

MAA Thailand, as part of a consortium, was selected to provide consulting services, which includes: project feasibility study, economic and financial analysis, project environmental and social impact study, public relations and participation, project cost estimation technical requirement and preliminary design.

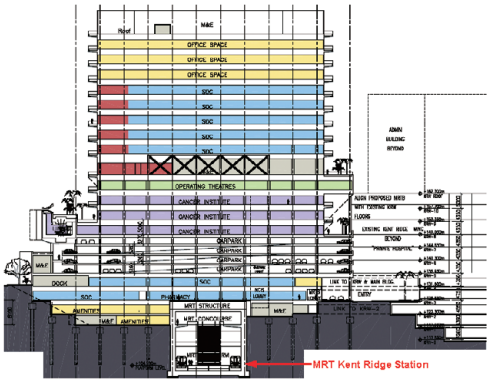
The State Railway of Thailand

CONSTRUCTION SUPERVISION OF HIGHWAY ALONG THE WEST COAST OF THAILAND

In June 2009, MAA Thailand was awarded the construction supervision service for the Highway Along the West Coast of Thailand by the Department of Rural Roads. The objective of the project is to develop a 53 km highway route along the west of Gulf of Thailand to connect to the tourist attraction spots along the west coast. The project includes the 2-traffic lane highway with 2 m. wide shoulders on both sides, widening of existing bridge to accommodate the new road, and road safety facilities. Other associated road facilities includes rest area, walkway, scenic point.

The Construction Supervision of Highway Along the West Coast

NATIONAL UNIVERSITY HOSPITAL-MRT BUILDING (NEW AMBULATORY MEDICAL CENTRE) AT LOWER KENT RIDGE ROAD, SINGAPORE



National University Hospital-MRT Building

The proposed development consists of the construction of one block of 14-storey medical tower resting on top of the newly completed MRT Kent Ridge Station with 2-level basement to be built on each side of the station. The project site is located at the western part (Kent Ridge) of Singapore

in close proximity to existing NUH Phase III Extension Block and MRT station. Due to the existence of newly completed MRT Kent Ridge Station and complicated geological formation consisting of Jurong formation with fold/fault and Limestone/ cavities found over the site area, competent geotechnical inputs are required for the foundation / excavation design. MAA Singapore was commissioned by National University Hospital to provide Geotechnical engineering services consisting of field supervision, laboratory testing and analysis work with regard to the foundation system and excavation work of the proposed development located with the Railway Protection Zone including assessment of construction effect on existing MRT station and tunnels. The project services started in September and end in December 2009.

PROPOSED RESIDENTIAL DEVELOPMENT (HUNDRED TREES CONDOMINIUM) AT WEST COAST DRIVE, SINGAPORE

The proposed condominium development comprises 8 Blocks of 12-storey apartment flat with attic with provisions for landscape deck with carparking facilities, swimming pool to be built over an existing condominium (Hong Leong Garden) site located at the western part of Singapore. The site was located within the complicated Jurong formation with difficulties anticipated in the pile installation works due to very erratic soil/rock profiles found in the site investigation works. MAA Singapore was engaged by M/s Grande-Terre Properties Pte Ltd to provide Geotechnical engineering services including soil investigation work with regard to the foundation system of the proposed development. The project services started in April and end in June 2009.

Hundred Trees Condominium

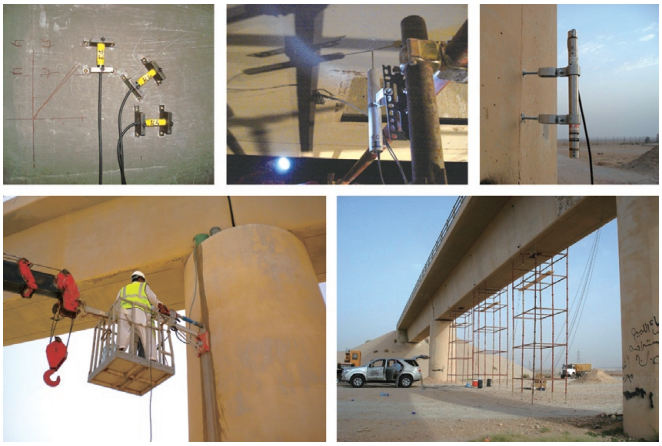
LAND LEVY FOR SPECIAL DISTRICT OF TAIWAN HIGH SPEED RAIL CHANGHUA STATION

HSR Changhua Station Land Development

Due to the possible impact of land use, transportation and urban place structure made by the establishment of high speed rail Changhua Station, the overall plan and development of Changhua Station Special District will be conducted in land levy way. It is predicted to achieve as business, trade, display and tourist service center among south Changhua area by completing establishment of public facilities and developing orientation of transportation, logistic, information and tourism center. The project with a total area of 203 ha. ranges from Shetou Urban Plan Area in north, Longtan Community in Tianzhong in south, North-south railway in east and County Raod No.150 in west. The scope of work of this project includes preliminary design, design review, construction supervision and project coordination on fencing, ground preparation, roadways, sewage system, wastewater, parks, parking lots, landscaping, lighting for public space and pipeline engineering. MAA Taiwan was engaged by the Changhua County Government to provide project management and construction supervision services. The project service started in September 2009 and is anticipated to end in June 2014.

DESIGN OF NEW BRIDGES AND EVALUATION OF EXISTING BRIDGES FOR RAILWAY LINE NO.1, KINGDOM OF SAUDI ARABIA

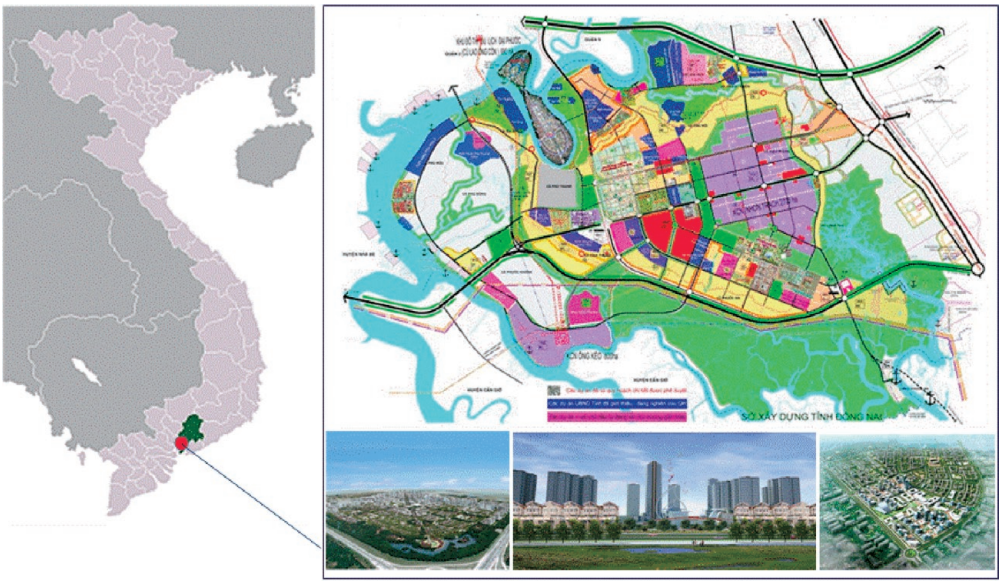
The current Railway Line No.1 in the Kingdom of Saudi Arabia is a passenger and freight dedicated railway line, operating at a speed of 120 km/hr with an axial load of 25 ton/axis. The Client, Saudi Arabia Organization, plans to upgrade the railway line by increasing the passenger trains to 250 km/hr with the same axial load and increasing the freight trains axial load to 32.5 ton/axis while maintaining the speed at 120 km/hr. The Saudi Arabia Organization invites consultants to perform the safety assessment and redesign of existing bridges between Riyadh and Hofuf as the first phase of the upgrading process. MDEC-MAA (Modern Design & Engineering Consulting – Moh And Associates, Inc.) Joint Venture was engaged to provide the assessment and redesign services, started in May 2010



Design of New Bridges and Evaluation of Existing Bridges for Railway Line No.1

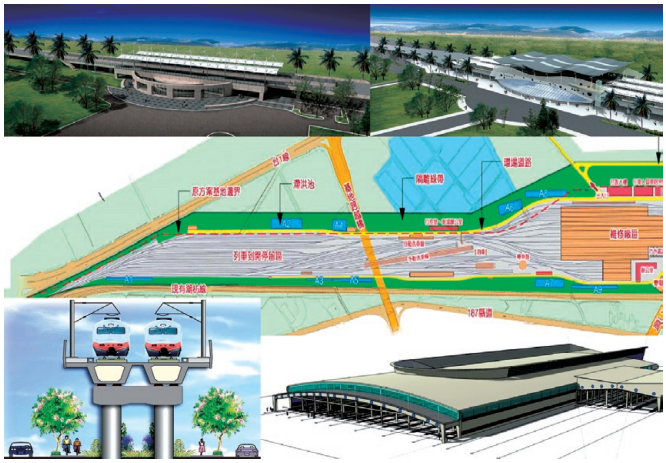
TECHNICAL SERVICE FOR COMMON DUCT PLANNING OF NHON TRACH NEW TOWN, VIETNAM

In recent years, Vietnam has been undergoing rapid economic development. Along with the growth are the many modern new towns, buildings, and infrastructures throughout the country. However, despite the rapid growth, underground construction and usage has just began. As part of the government's promotion of urban underground construction and to increase the efficiency of utilities management, Dong Nai Provincial Government committed to use Nhon Trach new town as the location for the country's first common duct planning. Upon completion, it will be the model for all towns in Vietnam. Nhon Trach is located in southwest of Dong Nai Province of Vietnam. It is a new district established with total area of 41,090 ha and will consist of government departments, residential, commercial, industrial and tourism area. To date, companies from Taiwan, Japan and South Korea have already moved into the industrial area. The government foresees a growing demand of public utilities as the district increases in population and activity. As a result, they are committed to carry out common duct as soon as possible. MAA was engaged by Vietnam Institute of Architecture, Urban and Rural Planning in May 2010 to carry out the planning of the common duct in Nhon Trach district.



Technical Service for Common Duct Planning of Nhon Trach New Town

TRANSFORMATION OF THE TAIWAN RAILWAY INTO MRT-TYPE RAILROAD PLAN- CHAO-JHOU PROJECT SUBSEQUENT DETAILED DESIGN SERVICES



Chao-Jhou Project Subsequent Detailed Design Services

In order to create a fast and convenient commuter rail system between Kaohsiung and Chaojhou in southern Taiwan, a plan was proposed to turn the single track, non-electrified section between Pingtung and Chaojhou into double-track electrified system. The project is due for completion in Dec. 2014. Upon completion, the commuting time from Kaohsiung to Pingtung and Kaohsiung to Chaojhou will be shortened to 35 and 45 minutes, respectively. In addition, travel time to central and northern Taiwan will be reduced. This project will eliminate 20 railway crossings. In addition, the existing Chaojhou Coach Yard will be moved from the east of Kaohsiung station to the new service base of 34.67 ha located 1.9 km south of Chaojhou. In September 2009, the Railway Reconstruction Bureau of the Ministry of Transportation and Communication engaged MAA Taiwan to provide the detailed design services for the project.

SHUEI-NAN ECONOMIC & TRADE PARK, TAICHUNG CITY

Shuei-Nan Economic and Trade Park development project is one of the major projects set forth by Taiwan's "Challenging 2008 – National Development Plan." The development project will be located at Taiwan's central international airport, Shuei-Nan Airport, which is currently undergoing relocation process. Shuei-Nan Economic & Trade Park, with a total area of 254 ha will integrate international standard trade, research, education, recreation and cultural facilities. A Taiwan Tower will be built around which a park, a university city, an exhibition center and an arena will act as the four major themes in the project. MAA was commissioned by the Taichung City Government to provide project & construction management and construction supervision services. The project service started in April 2010 and is anticipated to end in April 2014.

Shuei-Nan Economic & Trade Park, Taichung City

TURNKEY PROJECT ON KAOHSIUNG EXHIBITION & CONVENTION CENTER

Kaohsiung Exhibition & Convention Center is located at Kaohsiung Multi-purpose Commerce & Trade Park with a total area of 44,929 m^2. The international standard exhibition center, when built, will accommodate 1,500 booths (3m*3m), as well as provide a 2,000-seat conference room, two 800-seat medium conference rooms, and several meeting rooms with the newest software & hardware facilities. The selected turnkey project team will conduct planning, design and construction works to create a landmark in Kaohsiung City. MAA Taiwan was engaged by the Public Works Bureau Construction Office of Kaohsiung City Government to provide project & construction management and construction supervision services for this project. The project service is anticipated to end in December 2013.

Turnkey Project on Kaohsiung Exhibition & Convention Center

PROFESSIONAL ACTIVITIES

- ***Professional Activities***
- ***Professional Awards/Honors***
- ***International Meetings***
- ***Seminars and Conferences***
- ***Technical Publications***

Professional Activities

PUDONG NEW AREA STRATEGIC DEVELOPMENT SEMINAR (2010)

Pudong New Area Strategic Development Seminar

The Pudong New Area Strategic Development Seminar (2010) was held in Shanghai on 27th March 2010 discussing two main issues: the enhancement of core competitiveness of Pudong and Pudong's acceleration of development transformation. In April 2009, the State Council of the PRC approved the integration of Nanhui into the Pudong New Area, thereby expanding Pudong District Government's jurisdiction area. With the new challenge in managing a much larger land size, the Pudong District Government organized the Pudong New Area Strategic Advisory Board inviting 26 experts around the world to discuss possible ways to improve the development in education, infrastructure, finance, economy, etc. Dr. Za-Chieh Moh was invited as one of the expert to the seminar during which he gave a talk entitled, "Challenges to a Sustainable Physical Development," and was officially appointed as one of the members for the Pudong New Area Strategic Advisory Board from March 2010 to December 2012. The seminar was chaired by Mr. Jiang Liang, Pudong District Governor, Secretary Mr. Eli Lin, and Deputy Secretary Mr. Dai Haibo. Other invited experts included Vice Dean Mrs. Cheng Davis of University of Pennsylvania, Chairman Mr. Paul Kelly of Westgate Group USA, Professor Dennis Frenchman of MIT, Founder and Chairman Mr. Ma Yun of Alibaba, former Finance Minster Mr. Ziang Huaicheng of China, and several academicians. Over 100 government officials of the Pudong District Government attended the seminar.


聘　书

Certificate of Appointment

THIS IS TO CERTIFY

Za-Chieh Moh

AS A MEMBER OF THE PUDONG NEW AREA STRATEGIC ADVISORY BOARD

Shanghai Pudong New Area People's Government

Effective from March 2010 to December 2012

Certificate of Appointment for Dr. Za-Chieh Moh

Pudong New Area Strategic Development Seminar

GEOTECHNICAL ENGINEERING HERITAGE LECTURES

Senior Specialist Dr. Richard Hwang was invited by the Professional Geotechnical Engineers Association of Taiwan to give a series of Geotechnical Engineering Heritage Lectures from July to December 2009 covering geology, deep excavation, tunneling, dewatering, ground treatment, and risk management. The book, entitled "Underground Constructions and Risk Management," will be published following the lecture series.

1ST DUNSTAN D.S. CHEN MEMORIAL LECTURE – "GEOTECHNICAL ENGINEER FOR THE 21ST CENTURY"

At the initiation of the Sino-Geotechnics Research & Development Foundation, Dr. Za-Chieh Moh was invited to deliver the first Dunstan D.S. Chen Memorial Lecture. The lecture entitled "Geotechnical Engineer for the 21st Century" was delivered on 14th April 2009 in Taichung in conjunction with the 2009 Cross-Strait Seminar on Geotechnics. Text of the lecture was published in the journal Sino-Geotechnics, issue 123, March 2010.

Abstract:
In reflection to the changing behaviors of civil engineering and engineers in the last 50 years, geotechnical engineers today face many challenges in today's fast-paced changing world. This paper discusses the various attributes needed by a geotechnical engineer to meet society's demands in the new millennium. Attributes include communication, management, and leadership skills; international exposure; multi-disciplinary skills; and crisis awareness. Positive attitude and ethical practice in the profession are the basic necessity to attain the attributes. Civil and geotechnical engineering education and continual reforms in the industry laws and practices play a vital role in nurturing such needs.

NTU SEMINAR "THE CHALLENGES TO YOUNG CIVIL ENGINEERS IN THE COMING DECADES – FROM THE INDUSTRY PERSPECTIVE"

Mr. Richard Moh, Senior Vice President of MAA Corporate Development, was invited by National Taiwan University Professor Patrick Shang-Hsien Hsieh to give a lecture, entitled "The Challenges to Young Civil Engineers in the Coming Decades – from the Industry Perspective" on 2nd June 2010 to the post-graduate twin-program exchange and NTU civil engineering students. The students came from Vietnam, Cambodia, Bangladesh, Indonesia, France and Taiwan.

Professional Awards / Honors

• **In the year of 2009, Dr. Za-Chieh Moh, Chairman of MAA Group was elected/re-elected to be officers of the following Professional Organizations:**

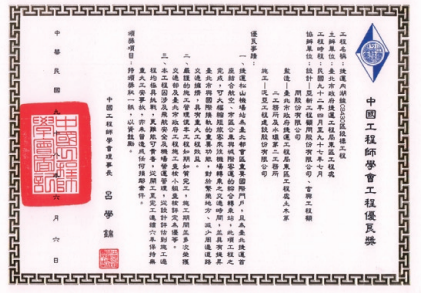
- Supervisor, Institute of Engineering Education, Taiwan, May 2009-May 2011
- Director, China Road Federation, and chairman of Awards Committee, Nov. 2009-Nov. 2011
- Vice President, Chinese Institute of Civil & Hydraulic Engineering, Dec. 2009-Dec. 2011
- Vice President, Chinese Association of Engineering Consultants, Dec. 2009-Dec. 2012
- Vice President, Taipei Federation of Engineering Consultants, Dec. 2009-Dec. 2012
- Chairman, Chinese Taipei EMF Engineers Monitoring Committee, 2009-2013
- Deputy chair, APEC Engineers Coordinating Committee, 2009-2011

• **Distinguished Professional Civil Engineer:**

The Taipei Professional Civil Engineers Association at its annual members meeting held on 10 April 2010 bestowed the honor of distinguished Professional Civil Engineer to Dr. Za-Chieh Moh for his services and contribution to the civil engineering profession. The Association has more than 2,500 active Professional Civil Engineers, and the award was given the first time in 2010.

• MAA Taiwan President Mr. Chien-I Hsu, was awarded the **AITAA (Asian Institute of Technology Alumni Association) Distinguished Alumni Award (2009) for Business and Professional** in September 2009.

• Project **Taipei MRT Neihu Line contract no. CB430** received Distinguished Engineering Award by Chinese Institute of Engineers in June 2009.


中國工程師學會工程優良獎

• MAA received a Letter of Appreciation for MAA's co-sponsorship of the 13th Geotechnical Seminar from Taiwan Geotechnical Society in August 2009.


2009 第十三屆大地工程學術研討會

感謝狀

茲感謝 亞新工程顧問股份有限公司

協辦本大會，貢獻良多，特致此狀。

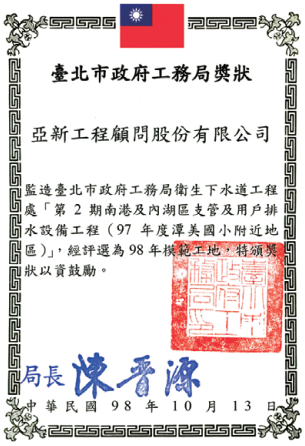
中華民國大地工程學會 敬贈

民國九十八年八月二十八日，台灣、宜蘭

• On 19 May 2009, Project **Design and Construction Supervision of Nanzih Yiqun Bridge and Roadway** received the Infrastructure Planning and Design Quality Award from the FIABCI-Taiwan Real Estate Excellence 2009 Competition (2009國家卓越建設獎競賽), which is organized by The Real Estate Association of the Republic of China (中華民國不動產協進會). The project was submitted by Kaohsiung City Government's Public Works Bureau, Construction Office. Yiqun Bridge is the first "double arch becoming single arch bridge" design in Taiwan. The arch begins as a double steel arch from Lantian Road in Kaohsiung and then merges into a single arch ending at Yiqun road across the 85 meter wide Houjing River.

• Mr. Steve Wang, President of MAA Shanghai, was assigned as Specialist to Shanghai Investment Consulting Corporation in August 2009. The Shanghai Investment Consulting Corporation, comprising 600 professional technical staff, was founded in 1986. The institute is mainly engaged in consulting and evaluating of preliminary works on major constructions in Shanghai City.

• Project **The construction supervision of sewer system for Nangang and Neihu district phase** II received Model construction Site Award by the Public Works Department of Taipei City Government in October 2009.


臺北市政府工務局獎狀

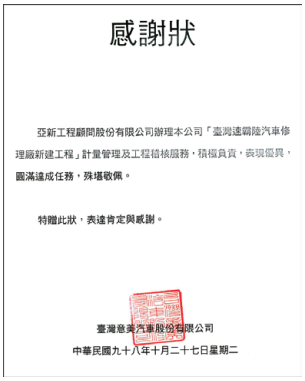
亞新工程顧問股份有限公司

監造臺北市政府工務局衛生下水道工程處「第 2 期南港及內湖區支管及用戶排水設備工程（97 年度潭美國小附近地區）」，經評選為 98 年模範工地，特頒獎狀以資鼓勵。

局長 陳晉源

中華國 98 年 10 月 13 日

• MAA received a **Letter of Appreciation from Taiwan Motor Image Co., Ltd.** in October 2009 in recognition for MAA's outstanding Quantity Survey and Auditing Services **on Subaru Taipei** 3S Center.


感謝狀

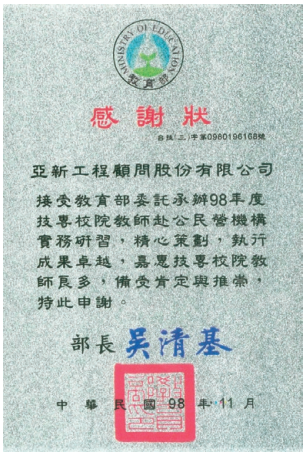
亞新工程顧問股份有限公司辦理本公司「臺灣速霸陸汽車修理廠新建工程」計量管理及工程稽核服務，積極負責，表現優異，圓滿達成任務，殊堪敬佩。

特贈此狀，表達肯定與感謝。

臺灣意美汽車股份有限公司

中華民國九十八年十月二十七日星期二

• MAA received a Letter of Appreciation from Ministry of Education in November 2009 for MAA to hold a course under the theme **"Engineering Practices for Public Institute and Private Enterprises Projects for Professional Schools teachers in 2009".**


感謝狀

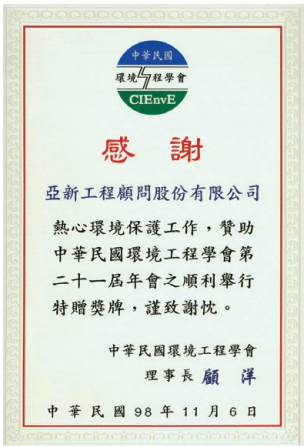
亞新工程顧問股份有限公司

接受教育部委託承辦98年度技專校院教師赴公民營機構實務研習，精心策劃，執行成果卓越，嘉惠技專校院教師良多，備受肯定與推崇，特此申謝。

部長 吳清基

中華民國 98 年 11 月

• MAA received a Letter of Appreciation for MAA's co-sponsorship of "21st Annual Meeting" from The Chinese Institute of Environmental Engineering in November 2009.


中華民國 環境工程學會 CIEnvE

感謝

亞新工程顧問股份有限公司

熱心環境保護工作，贊助中華民國環境工程學會第二十一屆年會之順利舉行特贈獎牌，謹致謝忱。

中華民國環境工程學會

理事長 顧洋

中華民國 98 年 11 月 6 日

International Meetings

INTERNATIONAL ENGINEERING ALLIANCE (IEA) MEETING

The International Engineering Alliance (IEA) held its bi-annual meeting from 15th to 19th June 2009 in Kyoto, Japan. The IEA represents 6 accords of which 3 are in engineering and 3 in education. In the capacity as the Chairman of the Chinese Taipei APEC Engineer Monitoring Committee and the Chinese Taipei EMF Engineer Monitoring commitee of the Chinese Institute of Engineers (CIE), Dr. Za-Chieh Moh attended the 5 days meeting along with Dr. John C. Li, Professors L.M. Chang & Edward Wang, Messrs C.S. Hsieh, Ter-Chuyau Yu, and Y.H. Ho. Dr. Moh was elected as the Deputy Chair of the APEC Engineer Coordinating Committee for the period from 2009 to 2011.

FEDERATION OF ENGINEERING INSTITUTIONS IN ASIA AND PACIFIC (FEIAP) MEETING

From 3rd to 5th June 2009, the Federation of Engineering Institutions in Asia and Pacific held its midterm meeting in Yangon, Myanmar. The meeting was hosted by the Myanmar Society of Engineers. Representing the Chinese Institute of Engineers, Dr. Za-Chieh Moh together with Mr. C.S. Hsieh and Mr. Ter-Chuyau Yu attended the 2 days meeting. FEIAP has 17 countries as full members.

17TH INTERNATIONAL CONFERENCE ON SOIL MECHANICS AND GEOTECHNICAL ENGINEERING (ICSMGE)

The 17th International Conference on Soil Mechanics and Geotechnical Engineering was held on 5-9 October 2009 in Alexandria, Egypt. Dr. Za-Chieh Moh was invited to chair the second session of the state-of-the-art report on design and analysis. In addition, one paper was represented by MAA staff, "Risk management for Underground Construction by C.T. Chin and H.C. Chao"

17TH SOUTHEAST ASIA GEOTECHNICAL SOCIETY CONFERENCE (SEAGC)

The 17th Southeast Asian Geotechnical Conference was held in Taipei From 10th to 13th May 2010. The conference was organized by the Southeast Asian Geotechnical Society and the Taiwan Geotechnical Society. More than 240 delegates from 22 countries took part in the 4 days event. This is the fourth time that Taipei hosts the conference in the 43 years history of the SEAGS. The conference's major theme Geo-engineering for natural hazard mitigation and sustainable development had two keynote lectures, several invited lectures, papers presentation and discussion sessions. In addition, six special sessions were organized with the support of Technical Committees TC34 & TC 39, Asian Technical Committees ATC 3 and ATC 10. Prominent international figures headed the Conference included Professor Jean-Louis Briaud, President of the International Society for Soil Mechanics and Geotechnical Engineering, Professor Michele B. Jamiolkowski, Professor Kenji Ishihara, Past Presidents of the ISSMGE, Dr. Dennis E. Becker, Vice President for North America and Professor Askar Zhussupbekov, Board Member of the ISSMGE and Professor A.S. Balasubramaniam & Dr. Za-Chieh Moh, Past Vice President for Asia.

Professor M. Jamiolkowski

To honor the contribution of Dr. Za-Chieh Moh to the development of geotechnical engineering in Southeast Asia, who is currently Chairman of the MAA Group, founder President of the SEAGS and Honorary founder Chairman of the Association of Geotechnical Societies in Southeast Asia, the SEAGS decided to have a "Dr. Za-Chieh Moh Distinguished Lecture." The first of such lecture was given by Dr. Moh's long time friend Professor M. Jamiolkowski on the first day of the Conference. The title of the lecture is, "The Geotechnical Problems of the Second World Largest Cooper Tailings Pond at Zelazny Most, Poland."

17th Southeast Asia Geotechnical Conference

MAA's participation in the Conference included the following papers:

• "Evaluation of Performance of Diaphragm Walls in Deep Excavations by Using Deflection Path Method" by H.C. Chao, J.F. Chang and R.N. Hwang.

• "3D Modeling of Pile Construction and Loading Effects on Adjacent Shield Tunnels - A Case Study" by J.F. Chang, T.C. Su, and I.C. Hu

MAA's Civil Engineering Technology Research and Development Foundation was one of the supporters of the Conference.

PILING & DEEP FOUNDATIONS ASIA

From 14th –15th July 2009, the Deep Foundations Institute organized a Conference entitled "Piling & Deep Foundation Asia" in Hong Kong. Dr. Za-Chieh Moh was invited to deliver a presentation to discuss a case study on the "Efforts of Installation of Bored Piles on Adjacent Structures". The paper was co-authored by Dr. D.W.Chang.

FIDIC 2009

The 2009 Annual Conference and General Assembly Meeting of the International Federation of Consulting Engineer (FIDIC) was held on 13th to 16th September 2009 at the Queen Elizabeth II Conference Centre in London. The Conference theme was Global challenges -Sustainable solutions. Attendees included Senior Vice President Mr. Richard Moh and President of MAA Shanghai Mr. Steve Wang.

"MANAGEMENT OF INVESTMENT AND CONSTRUCTION OF URBAN UNDERGROUND WORKS HANOI VIETNAM

Mr. Ben Lin at the workshop "Management of Investment and Construction of Urban Underground Works" in Hanoi City

Urban underground development will be one of the main development works, Vietnam will be experiencing in the coming years. In order to learn the experiences of underground construction from other countries, the Ministry of Construction of Vietnam co-orgnaized with APAVE Vietnam & Southeast Asia the workshop "Management of Investment and Construction of Urban Underground Works" in Hanoi City on 15th July 2009.

A total of 10 presentations from Vietnam, Japan, China, Korea and Taiwan were made during the workshop. Mr. Ben Lin, currently Manager of Construction Supervision Department of MAA Taiwan was invited to give the presentation on "Introduction of Common Duct System in Taiwan." Over 150 guests from various government agencies in Vietnam attended the workshop.

TECHNICAL PUBLICATIONS

Chao, H.C., Chang, Jung-Feng and Su, T.C. (2009), “Geotechnical Risk Assessment and Management in Rapid Transit Projects,” *Proc. of the Symposium on Engineering Risk Management*, Taipei, 5 May, pp. 109-132. (in Chinese)

Chao, H.C., Chin, C.T. and Su, T.C. (2009), "Reliability Analysis for Groundwater Pumping in Deep Excavation," *Proc. of the 4th World Forum of Chinese Scholars in Geotechnical Engineering*, Wuhan, China, 20-21, August, pp. 151-156. (in Chinese)

Chao, H.C., Feng, J.F. and Hu, I.C. (2009), “Numerical Modeling in Soft Ground Engineering,” *Proc. of the13th Conference on Current Researches in Geotechnical Engineering in Taiwan & CIE-IEM Joint Seminar on Geotechnical Engineering*, I-Lan, 26-28 August. (document in CD format).

Chin, C.T., Chao, H.C. and Chen, J.R. (2009), “Use of Bayesian Theorem in Updating the Probability of Soil Liquefaction," *Proc. of The13th Geotechnical Conference in Taiwan*, I-Lan, 26-28 August, pp. J-81~J-85. (in Chinese)

Chin, C.T., Chao, H.C. and Chang, D.W (2009), “A Retrospection on Foundation Design of Taipei 101,” *Proc. of International Symposium on Urban Geotechnics*, Incheon, Korea, 25-26, September, pp145-156.

Chin, C.T. and Chao, H.C. (2009), “Risk Management for Underground Construction,” *Proc. of the 17th International Conference of Soil Mechanics and Geotechnical Engineering*, Alexandria, Egypt, 5-9, October, pp. 2686-2689.

Chua, H.Y., Chao, H.C. and Chin, C.T. (2009), “Sustainable Design based on Near Nature Construction Method- A Case Study,” *Proc. of the International Symposium on Geoenvironmental Engineering in Hangzhou*, China, 8-10, September, pp. 901-906.

Chung, C.T., Wang, M.J., Duann, S.W. and Hwang, R.N. (2009), “Remedy of Damage to a Shield Tunnel in the Banchiao Line of the Taipei MRT,*” Difficult Cases in Geotechnical Engineering - MRT design and construction*, edited by Fang, et al. (in Chinese)

Ju, H., Duann, S.W. and Hwang, R.N. (2009), “Influences of Drifting Woods on Construction of the Taipei MRT,” *Difficult Cases in Geotechnical Engineering - MRT design and construction*, edited by Fang, et al. (in Chinese)

Kang, S.M., Whang, Y.H., Su, T.C. & Kao, C.C. (2009) "Application of Ductile Segments for the Bored Tunnel of MRT System," *Proc. of Seminar on 2009 Cross Strait on Ground Engineering*, 14 April, Taichung, Taiwan. pp. 163 –168. (in Chinese)

Kao, C.C., Chen, C.H. and Hwang, R.N. (2009), “Mechanism of Ground Settlements and Heaves due to Shield Tunneling,” *J. of GeoEngineering*, v4(2), August, Taipei, 63~72.

Lai, Y.F., Su, T.C. and Chen, C.H. (2009), “Case Study of Trials of Anti-Liquefaction Grouting for Shield Tunnels," *Proc. of the 13th Conference on Current Researches in Geotechnical Engineering in Taiwa*n, I-Lan, 26-28 August, pp. I26-1~I26-5. (in Chinese)

Lai, Y.H., Su, T.C., Chao, H.C. and Lee, S.R. (2009), “Case Study of Design Considerations of an MRT Station Under a Historical Site," *Proc. of 2009 Cross Strait Seminar on Geotechnics,* Taichung, Taiwan, 14-16 April, pp. 247-252. (in Chinese)

Yang, G.R., Hwang, R.N., Fan, C.B., Chao, C.L. and Wong, K.N. (2009), “Remedy of damage to the flexible joint at tunnel portal in Contract CH221 of the Taipei MRT,” *Difficult Cases in Geotechnical Engineering - MRT design and construction*, edited by Fang, et al. (in Chinese)

PERSONNEL PROFILES

Mr. Yung-Her HUANG （黃永和）

Mr. Yung-Her HUANG was promoted to Vice President MAA Taiwan in charge of overseas business in February 2010. Mr. Huang received his bachelor's degree from National Taiwan University in 1982 and master degree from University of Iowa in 1987. Prior to joining MAA, Mr. Huang was employed as an assistant engineer in Kung-Sing Eng. Corp. In 1987, Mr. Huang joined MAA and had been involved in the design of many viaducts and bridges for highways and freeways. He also participated and led designs on MRT and tall buildings projects, including Taipei MRT Nangang Line, Mucha Line Tail Track, Ministry of Audit Building and Central Union Office Building in Taipei. Since the 1990s, he had been heavily involved in various phases of the Taiwan High Speed Rail Project (contract no. C250, C280, C260, C291, C295 and C296) as structural design and project director. Mr. Huang was also responsible for many design work for MRT project such as Kaohsiung MRT contract no. CR4, CO2 and CR6. To date, he has co-published 4 technical papers. He is also member of Chinese Institute of Engineers and Rail Engineering Society of Taiwan.

Mr. Chen-Hui HSIEH （謝震輝）

Mr. Chen-Hui HSIEH was promoted to Vice President MAA Taiwan leading all engineering design departments of MAA Taiwan in February 2010. Mr. Hsieh received his bachelor's degree in civil engineering from Chung Yuan Christian University in 1986 and master degree in structures from National Central University in 1991. Since graduation, he joined MAA Taiwan and has been involved in many projects including structural design for tunnels, bridges, buildings, viaducts, underground MRT Stations, sewerage systems, wastewater treatment plants, and various facilities and MRT lines. Examples include the Fushing North Road Extension Tunnel under Song Shan Airport, Taipei MRT Mucha extensions, Kaohsiung MRT Depot stations, facilities at the Keelung Harbor, Tien Mu sewerage system and widening of a North Second Freeway section. Mr. Hsieh is member of Rail Engineering Society of Taiwan. He was elected as MAA's Staff of the Year in 1996.

Mr. Shih-Chang HUANG （黃士彰）

Mr. Shih-Chang HUANG, a bachelor's degree graduate of the National Cheng Kung University in 1988 and master's degree graduate from the same university in 1990, was promoted to Senior Manager in MAA Taiwan leading the Construction Supervision Department and Project & Construction Management Department as well as MAA Kaohsiung Office. Prior to joining MAA, Mr. Huang was employed as Civil Engineer by Pacific Engineers & Constructors, Ltd and was involved in works including feasibility study of Northern Taiwan LNG Terminal & Construction of Power Plant, Safety Evaluation of Wu-Zai Dam, Hydraulic Analysis of Nan-Pu Power Plant. He joined MAA in 1994, and has since undertaken several major projects including the Taipei and Kaohsiung City Common Duct Master Plan, Kaohsiung MRT Orange Line detailed design and Taipei MRT Hsinyi Line detailed design. Mr. Huang is a Registered Professional Engineer (Hydraulics), Registered Quality Control Engineer and Registered Reinforced Bar Radial Investigation Engineer. He is also member of Chinese Institute of Engineers and Chinese Institute of Civil and Hydraulic Engineering.

Mr. William W. L. DONG （董文良）

Mr. William W. L. DONG joined MAA Shanghai in August 2009 and was assigned as Vice President in charge of pharmaceutical design operation. Mr. Dong graduated from the Department of Fine Chemistry (discipline of pharmaceutical engineering) of East China University of Science and Technology in 1986. Thereafter he joined the Shanghai Pharmaceutical Engineering Design Institute (SPIDI) under the then State General Bureau of Medicine (former State Food and Drug Administration) and has served the organization for 23 years until he joined the German consulting firm I+O Industry Planning + Organization in Shanghai as Senior Advisor in early 2009. During the period in SPIDI, Mr. Dong started as an assistant engineer and then was promoted to engineer, senior engineer, project manager and lastly Class-A project manager. He has been the process leader or project manager in over 30 projects of local and international clients, which include formulation of various dosage forms, active pharmaceutical ingredient and bio-pharmaceuticals. With the knowledge and experience gained in project operation, Mr. Dong is specialized in interpretation and implementation of GMP guidelines of China, US and EU. With such background he is currently an expert and a member of many pharma-related organizations and committees.

Mr. Zhi-Gang KAO （高志剛）

Mr. Zhi-Gang KAO joined MAA Shanghai in August 2009 as Director of Chemical Process Center. Mr. Kao graduated from the School of Chemical Engineering, East China University of Science and Technology in 1988. Since graduation, he joined Shanghai Institute of Pharmaceutical Industry of State Drug Administration as Engineer, Chief Designer and Project Manager. He had been involved in pharmaceutical plants constructions such as Shandong Xinhua Pharmaceutical Plant, Qinghai Pharmaceutical Factory, Beijing Rhone-Ponlenc Rorer Pharmaceutical Company and Zhejiang Jianfeng Pharmaceutical Company etc. Mr. Kao was in charge of engineering design and feasibility study of above pharmaceutical projects. He has co-edited China's Chemical Process and Design Handbook third and fourth edition.

Mr. Shaw-Wei DUANN （段紹緯）

Mr. Shaw-Wei DUANN was assigned as Senior Manager of MAA Taiwan Transportation and Civil Engineering Department in February 2010. Mr. Duann received his bachelor's degree in civil engineering from Chung Yuan Christian University in 1977, master's degree in civil engineering from National Cheng Kung University in 1981 and master's in geotechnical engineering from University of Massachusetts at Amherst in 1986. Mr. Duann joined MAA Taiwan shortly after his graduation in 1986. Since then, Mr. Duann has participated and led many major projects including North Second Freeway, Geotechnical Characteristics of the Taipei Basin Deposits, power plants, Geotechnical Engineering Specialty Consultancy of Taipei MRT, Taiwan High Speed Rail, and several sections of Taipei MRT and Kaohsiung MRT. Mr. Duann has also undertaken many deep excavation projects and successfully trouble-shooted many geotechnical problems. He was assigned as Technical Vice President to MAA's affiliated firm, AGILETECH Engineering Consultants Co. Ltd. in Beijing, from August 2007 to August 2009. To date, he has published 27 technical papers. He is a member of Chinese Institute of Civil and Hydraulic Engineering, Taiwan Geotechnical Society, Southeast Asian Geotechnical Society.

Mr. Ting-Chiun SU （蘇鼎鈞）

Mr. Ting-Chiun SU was promoted to Senior Manager of MAA Taiwan Geotechnical Department in February 2010. Mr. Su received both his bachelor's of science degree in Civil Engineering and master's degree in Geotechnical Engineering from the National Central University in 1984 and 1989, respectively. Since graduation, Mr. Su joined MAA and during the years he has participated in many major projects including site investigations and foundation analyses for high-rise buildings, assessment of building protection for deep excavation, geotechnical consultancy for foundation excavation, foundation design for bridges, ground improvement design for road embankments and newland developments and Taipei MRT designs. Some specific examples include planning and design of soil improvement for the reclamation of Keelung River, deep excavation and building protection assessment for Taipei Railway Underground Pan-chiao Extension Project, site investigation and foundation analysis for Chiahui Power Plant, geotechnical engineering design for Taipei MRT DB144A, DB144B, DR148 and DG166 design lots. To date, he has published/co-published 30 technical papers. Mr. Su is a registered Professional Geotechnical Engineer and he is also member of Taiwan Geotechnical Society and Railway Engineering Society of Taiwan.

Mr. Chin-Der LIN （林金德）

Mr. Chin-Der LIN was promoted to Senior Manager of MAA Taiwan Environmental & Water Resources Engineering Department in February 2010. Mr. Lin received both his bachelor's and master's degrees in Civil Engineering from the National Central University in 1985 and 1989. Mr. Lin joined MAA since graduation and has participated in many projects including detailed design and construction supervision for Ming- Hsiung Industrial Park Wastewater Treatment Plant Rehabilitation, design review for Yung-Kang Wastewater Treatment Plant, and Ping-Cheng Wastewater Treatment Plant. He was involved in some Environmental Impact Assessment (EIA) Projects about the traffic construction. He also undertook the environmental inspection planning on the project of the Earth-Filled work in the Abandoned Keelung River Course. He also participated in the High Speed Rail project (Tainan to Kaohsiung) as an engineer to plan and design sound barriers. He also joined the planning and design work of Tao-Yuan Municipal wastewater treatment plant project. Currently, he is in charge of Environmental Impact Assessment projects and e detailed design work for sewer system projects. He is a active member in promoting ecological engineering method planning on public construction and BOT projects for municipal sewer systems. To date, he has published/co-published 9 technical papers. Mr. Lin passed many qualifications on Professional Engineering including Registered Environmental Engineer, Registered Industrial Safety Engineer and Industrial and Mining Hygiene Engineer. He is also a member of The Chinese Institute of Environmental Engineering, the Chinese Institute of Engineering Environment and Taiwan Water Environmental Association.

Mr. Shyan-Ching JANG （鍾賢慶）

Mr. Shyan-Ching JANG was promoted to Manager of Structural Engineering Department of MAA Taiwan in February 2010. Mr. Jang graduated from the National Taiwan University in 1986 and received his M.S. degree from the Carnegie-Mellon University in Civil Engineering in 1990. After graduation, Mr. Jang had worked as Structural Engineer in T.Y. Lin International and as Deputy Manager in Prosperity Engineering Corp., During which his major works included bridge detail design works of Taiwan Area Sun Yat-Sen National Freeway Widening Project for Contract 11, 14, 15 and 27, MacArthar Bridge No.2 in Taipei City and Pinlin interchange of Taipei-Ilan Expressway. planning and design of Chai-Yi Winery Buildings project, and detail design of R.O.C. Air Force Human Centrifugal Building Project. Mr. Jang joined MAA in 1994 and was responsible for several viaducts in the Nantou Section of the second Freeway, design of Landside Road System for the Second Bangkok International Airport, base design of the Taiwan High Speed Rail project for BOT tendering. Mr. Jang is a member of Society of Theortical and Applied Mechanics and Taiwan Agricultureal Engineers Society. To date, he has co-published 5 technical papers.

Mr. Tung-Lih YEN （顏東利）

Mr. Tung-Lih YEN of the Transportation and Civil Engineering Department was promoted in April 2009 to Senior Engineer I. Mr. Yen received his bachelor's degree in Civil Engineering from National Central University in 1977 and master degree in Civil Engineering from National Taiwan University in 1981. Upon graduation, Mr. Yen joined MAA as an assistant engineer in the Geotechnical Department. Six years later, he was promoted to a senior geotechnical engineer with major works undertaken during this period including: (1) site investigation, (2) the study of soil engineering properties, (3) foundation analysis and design, (4) soil improvement. Then, Mr. Yen transferred to Instrumentation Section as a section leader from 1998 to 1990 involving in the Taipei Metropolitan Rapid Transit (TMRT) Tamshui Line project, and acted as a geotechnical specialist consultant. Mr. Yen worked in Geotechnical Engineering Department II since 1992 with major works undertaken including: (1) investigation and study of slope stability, (2) design of slope stabilization, (3) engineering geology, (4) rock tunnel design, (5) geotechnical design of freeways. He was also involved in the design of Contract C220 of Taiwan High Speed Railway Project and acted as a project manager from June 2000 to December 2000. At present, he is the design manager of Design Lot DR148 of Taipei MRT Xin Yi Line. Mr. Yen passed many qualifications on Professional Engineering including Registered Professional (Civil) Engineer, Registered Professional Geotechnical Engineer, Registered Professional Soil and Water Reservation Engineer and Registered APEC Engineer (Geotechnical). He is a member of Chinese Taipei Tunneling Association, Taiwan Geotechnical Society, Taiwan Professional Civil Engineers Association, Taiwan Professional Geotechnical Engineers Association and Taiwan Professional Water and Soil Reservation Engineers Association.

Mr. Chia-Feng LU （呂嘉峰）

Mr. Chia-Feng LU was promoted to Senior Engineer of MAA Taiwan Taichung MRT Project in April 2009. Mr. Lu received both his Bachelor's and master degree in civil engineering from National Cheng-Kung University in 1990 and 1992. Prior to joining MAA, Mr. Lu worked as an assistant engineer in structural and civil engineering for Pro-Tech, Inc. Since joining MAA in 1993, he has been involved in many detailed design projects including Second Freeway-Nantou Section Project, Second Freeway-Taichung Section Project, High Speed Rail Project Tainan-Kaohsiung Section, Chung-Tou Highway for contract CT011 & CT012, Taiwan High-Speed Rail Project for Contract C250 Wu-Jih depot Line, Second National Freeway (Dajia - Jhangbin section) and Land acquisition consultancy service on new Sinjhuang City Government Center project etc. He is currently working on the General Consultancy and basic design of Taichung MRT Project - Wujih-Wenshin- Peitung Line. To date, he has published 3 technical papers.

Mr. An-Tai CHANG （張安泰）

Mr. An-Tai CHANG was promoted to Senior Engineer in April 2009 and appointed as a Section Chief of MAA Taiwan Taichung Office of Taichung MRT Project in September 2009. Mr. Chang obtained a bachelor's degree in civil engineering from Feng Chia University in 1986 and a master's degree structural engineering from National Taiwan University in 1991. Prior to joining MAA, Mr. Chang worked as an engineer in Continental Engineering Corporation, during which his major works included pile construction, foundation construction, pier construction, box girder construction, engineering management & project and cost analysis. Mr. Chang joined MAA Taiwan in June 1993 and has participated in many major projects including master plan and design of common duct and tendering process for Kaoshuing City multi purpose economic and trade park, planning and design of East-West Expressway - Houlong to Wunshuei Section, detailed design for turnkey contract of KMRT Orange line Daliao Depot (CD1), detailed design of Taipei MRT Songshan Line contract DG166 and design of many other bridge projects of expressway such as Jhangbin Expressway, Nanliao-Jhudong Expressway, Houlong-Wunshuei Expressway and Chung-tou Expressway etc. Mr. Chang is now mainly working on General Consultancy and basic design of Taichung MRT – Phase Ⅲ and is in charge of project control. To date, he has published 2 technical papers.

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