



# MAA Bulletin

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桃園市郵政物流園區建築工程專案管理  
PCM for the Chunghwa Post Logistics Park,  
Taoyuan City, Taiwan

亞新工程顧問(集團)公司  
MAA Group Consulting Engineers

TAIPEI KAOHSIUNG TAICHUNG BANGKOK YANGON  
SINGAPORE BEIJING HONG KONG MACAU

## MAA Bulletin

Issue 72 NOVEMBER 2024

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, environment, buildings, land resources, and information technology.

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

Today, **MAA** has over 1,200 employees with companies in Beijing, Shanghai, Hong Kong, Macau, Taipei, Bangkok, Singapore and Yangon, creating a close professional network in East & Southeast Asia.

**MAA's** business philosophy is to provide professional services that will become an asset to our clients with long lasting benefits in a rapidly changing social-economic environment. **ASSET** represents five key components that underline **MAA's** principles of professional services:

**A**dvanced Technology  
**S**afety  
**S**atisfaction  
**E**conomical Solution  
**T**imely Completion

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### ISO 9001 AND LAB CERTIFICATIONS



# VALEDICTION FOR DR. ZA-CHIEH MOH

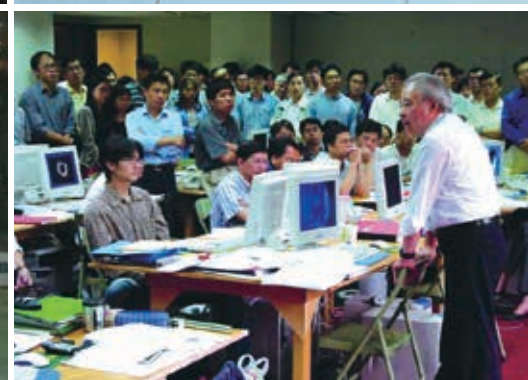
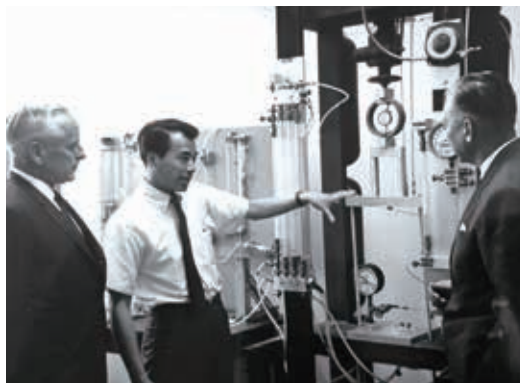
CO-FOUNDER AND CHAIRMAN OF THE BOARD OF THE MAA GROUP







Dr. Za-Chieh Moh (1931-2024)



It is with profound sorrow that we announce the passing of the co-founder and Chairman of the Board of the MAA Group, Dr. Za-Chieh Moh in March 2024 at the age of 94.

Dr. Moh graduated from National Taiwan University in 1953, received a master's degree in civil engineering from Iowa State University in 1955, and obtained a Doctor of Science degree in geotechnical engineering from the Massachusetts Institute of Technology (MIT) in 1961. He embarked on his career in the academia as the Assistant Professor at Yale University from 1961 to 1965 and was invited to continue to build the engineering school and spearhead the Geotechnical Engineering Department in the SEATO (Southeast Asia Treaty Organization) Graduate School of Engineering, Asia's first graduate school of engineering, in 1964. The SEATO was renamed the Asian Institute of Technology (AIT) in 1967. During his tenure at AIT, Dr. Moh served in positions from associate professor, professor, to vice President and Provost. Among his significant achievements during this period, he recruited and trained top students from Asia, many of whom later became leaders in various fields in their countries. He characterized and named Bangkok Clay, elevating it to prominence alongside renowned counterparts like Boston Clay, Chicago Clay, and London Clay within the global geotechnical engineering community. Additionally, he established the Southeast Asian Geotechnical

Society (SEAGS) in 1967 and, along with several prominent engineers from Southeast Asian countries, co-founded the Road Engineering Association of Asia and Australasia (REAAA).

In 1975, Dr. Moh decided to leave the academic world and become a practicing professional engineer. With the vision of enhancing capacity building for the Southeast Asian region through establishing an international professional consulting group of firms based in Asia, he and his brother, Dr. Za-Lee Moh, co-founded Moh and Associates (MAA) in Singapore and Taiwan. Over 49 years of practice since then, MAA carried out numerous pioneering works such as Geotechnical Engineering Mapping of Taipei Basin, Geotechnical Engineering Specialty Consultancy (GESC) for Taipei MRT, Taipei Songshan Airport Underpass - world's first underpass under an operating airport runway, and Suvarnabhumi International Airport - world's largest soft ground improvement project using PVD method. The company expanded its professional consulting services to include a diverse range of areas, such as roads and highways, high-speed rail, MRT systems, new town development, airport, harbor, bridge, tunnel, common duct, polluted soil remediation,





wastewater treatment and reclamation, digital applications, and more across the Asian region. The company grew significantly, evolving from a 3-person specialty geotechnical engineering consulting firm to a 1,200-person multidisciplinary engineering consulting group. Today, MAA operates in Singapore, Taiwan, Hong Kong, Malaysia, Thailand, Beijing, Shanghai, and Myanmar, with projects in over 60 cities worldwide.

Despite being busy running the company, Dr. Moh never ceased his commitment to capacity building. He co-founded the Federation of Engineering Institutions of Asia and the Pacific (FEIAP) in 1978. He served as the chairman of Taipei Professional Civil Engineers from 1980 to 1985. He founded the Chinese Union of Professional Civil Engineers Association in 1992. Under his initiative, Taiwan joined FEIAP in 2008. Also, he initiated the annual CIE-HKIE-IEM Tripartite Seminar, which has been held alternatively among Taiwan, Hong Kong, and Malaysia since 2009. Furthermore, he promoted the APEC Engineer accreditation system and chaired the committee from 2011 to 2015. Dr. Moh played active roles in China Road Federation (CRF), Chinese Institute of Civil and Hydraulic Engineering (CICHE), Chinese Institute of Engineers (CIE), Institute of Engineering Education Taiwan (IEET), etc. He never stopped promoting internationalization

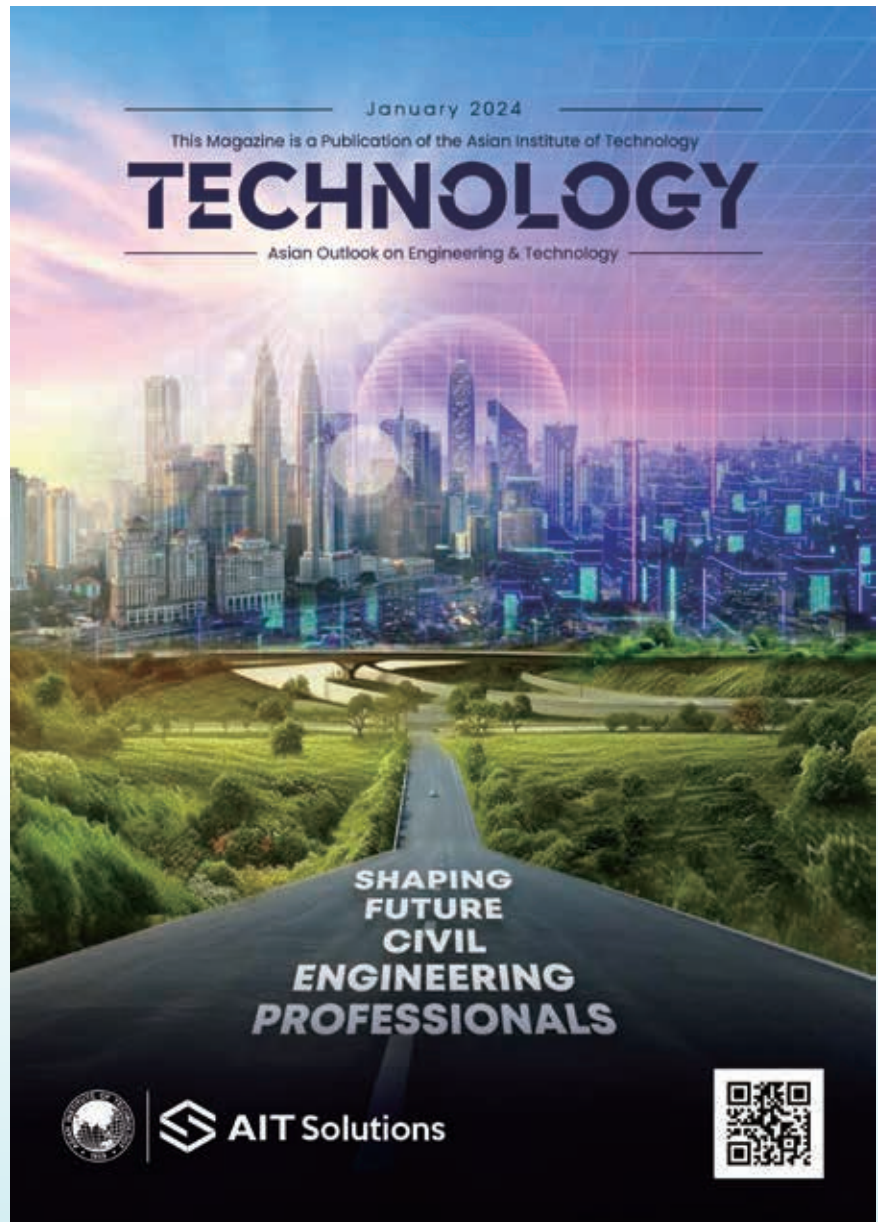
for engineers in Taiwan. In recognition of his unselfish dedication and achievements, Dr. Moh received the Man of the Year Award from the China Road Federation and the Gold Medal Award for Academic Achievement from the Chinese Institute of Civil and Hydraulic Engineering in 1983. He was awarded honorary membership by REAAA in 2000 and by the Japanese Geotechnical Engineering Institute (JGEI) in 2003. In 2008, he was elected both as APEC Engineer of the Year and FEIAP Engineer of the Year. Additionally, Dr. Moh received the Civil Engineering Achievement Award from ACECC in 2016, the Engineering Medal from CIE in 2021, and the Anson Marston Medal from the College of Engineering at Iowa State University during the 89<sup>th</sup> Honors & Awards in 2021.

Although strict in his work, Dr. Moh was actually a highly approachable person. His office was always open and welcomes everyone. He was always ready to give advice, and almost no one has ever seen him show a moment of impatience while doing so. He emphasized that data reliability is critical for all engineering work. Consequently, in MAA practice, all soil investigations require an MAA engineer to be on-site for supervision. In geotechnical engineering, he encourages engineers to get their hands dirty so that they can feel the soil they are working with. He never stopped reminding design engineers to always visit the site to understand how things are built. He was always eager to stay updated with the latest technology and practices. Engineers were encouraged to write papers not only to share their experiences with others but also to enhance their discipline by writing concisely and precisely. Dr. Moh published over 160 internationally recognized and highly sought-after papers with his colleagues. Notably, one of his last papers focused not on a technical topic but on professionalism and ethics, which also became widely read. To Dr. Moh, titles are always earned and given by others, as there are no shortcuts to recognition. He seldom took credit, always attributing these pioneering works to the collaboration of colleagues, friends, and clients.

Ethics, accountability, dedication, and innovation were the four core values that Dr. Moh continuously promoted and exemplified whenever facing difficulties and challenges. His character, knowledge, professionalism, elegance, passion, and pioneering spirit have made him a role model in engineering field, and without any doubt, will continue to transpire in our world.


# AIT SOLUTIONS

Richard Moh was invited by AIT Solutions, Asian Institute of Technology (AIT), to share his insights during the Q&A section of the December 2023 issue of Technology Magazine. This issue focused on the theme "Shaping Future Civil Engineering Professionals." Technology Magazine explores a broad spectrum of ideas with an emphasis on engineering and technology from an Asian perspective. As one of the official publications of the AIT, Technology serves as a forum for professionals and researchers to share and disseminate their contributions to technological advancement in the Asian region.



*Note: The Following Article are Reprinted from Technology Magazine*





# Engineering the Future: Q&A with Richard Moh on Digital Landscape and Sustainability in Civil Engineering

**Richard Moh**

Chairman, Moh and Associates, Inc.  
member of MAA Group



Could you share your insights regarding the significance of industry-academia collaboration in shaping future civil engineering professionals?



Industry and academia collaboration has always been crucial in shaping the landscape of various professions. This is equally, if not more, true for civil engineering professionals. The fact that civil engineers build necessary infrastructure for the well-being of societies already indicates the scale of the projects they have to manage. The scale of such projects is highly integrated with both our built and natural environment. The complexity in the issues involved has consistently necessitated close collaborations among government, industry and academia.

Through the execution of projects, the industry would not only know the pertinent issues that may require research and development, but also know the necessary skills and knowledge that engineers need for the future. Academia provides more space and fewer interruptions for focusing on the research and developments of

these problems. Academia also can leverage the creativity of young minds to generate newer and more innovative ideas that the industry may not be able to conceive. Areas of developments include R&D of construction process, construction materials, contractual relations, new design approaches, contract issues and the use of digitalization technology. Quality engineers play a crucial role in ensuring safety and maintaining quality throughout design and construction phases. Engineers need to be equipped with the skill set to collaborate with people from diverse backgrounds, including those without engineering expertise. In industry practice, civil engineers must communicate clearly with government officers of all levels, work closely with various civil engineering specialists, collaborate with financial and legal professionals, and engage in effective communication with the public and laborers.



It is important for industry to provide ongoing feedback to academia regarding the skills, attitudes and values required in the workforce. This ensures a steady stream of talented individuals entering the profession. Mutual collaboration between industry and academia is essential for enhancing the professional environment of the civil engineering. In the context of today's challenges, including digital technology disruptions, climate change, and geopolitical shifts, a closer and tighter collaboration between industry and academia is more crucial than ever.

**Q** Considering the fast-paced evolution of technologies, what transformative impact do you believe emerging technologies can have on the field of civil engineering?

**A** The technologies today are evolving much more rapidly than the field of civil engineering can keep pace with. Technologies such as 3D scanning, drones, digital modeling, and cloud computing can bring both positive and negative impacts to the field of civil engineering. Referring to my lecture, "Engineering Digitalization in Our Built Environment," at AIT in October 2023, some of the positive transformative impacts include enhancing efficiency across each stage of project cycle, boosting productivity, fostering clear communications among all stakeholders, achieving cost savings, and contributing to sustainability. These technologies enable engineers to gain a more comprehensive global perspective throughout planning, design, construction and operation/maintenance stages. As a result, the design process of a project can undergo changes, fostering greater collaboration among engineers from different disciplines, and allowing for the consideration of requirements at later stages ahead of time. All of these, if done carefully, can enhance the quality and

safety of the project. However, all of this depends on the ability to change the mindset and traditional habits of engineers. The process of adopting new technologies must be carefully planned and monitored to prevent overdependence, thus avoiding a decrease in reliance on the critical and fundamental engineering judgment.



**Q** With an increasing focus on climate change and sustainability, how does MAA envision its role in championing eco-friendly practices within the civil engineering field?

**A** Climate change is a dire situation which all humanity must face together. We must all try our best to minimize the activities that instigates climate changes. In MAA, the ideas of eco-friendly practice began as early as the founding of the company. The guiding principles of professionalism, integrity, quality and people are highlighted as the core values at MAA emphasized by our two founders, Dr. Za-Lee Moh and Dr. Za-Chieh Moh. MAA has been dedicated to sustainable development since early 1990s, aligning with the global awareness to combat climate change. The focus and approach of civil engineering at MAA underwent a transformation, shifting from traditional mere service-oriented model to a collaborative engagement with people, the built environment, and the natural world.

We not only encourage our engineers to be aware of the necessity of green actions but also actively promote industry awareness





and advocate for changes in regulations. As an example of green action, the Fazih River Management Project located in Taichung Taiwan adopted a nature-oriented design and construction method. In this initiative, natural materials, including boulders, logs, and vegetation, were extensively used as eco-friendly alternatives to conventional reinforced concrete. This choice was made to protect the flora and fauna resources within the river's ecosystem. Another noteworthy example is the Taipei Mass Rapid Transit System, where a station was relocated to protect the habitat of the Taipei Tree Frog, an endangered species, specifically. This project was carried out with intensive eco-system monitoring and close interaction with ecological conservation group. In addition, MAA conducted an extensive study on the application of eco-technology in road engineering. Planning and design principles adaptable to the practical conditions of the eco-system under consideration were proposed as guidelines for practical road design.

In land development, MAA has widely adopted the principle of balancing excavated and backfilled soils to eliminate environmental impacts resulting from the transportation of soils. For water reuse, MAA has been served as both the design and project management consultants for major water reclamation plants across Taiwan. The completed plants currently provide 18,000 cubic meters per day ( $\text{m}^3/\text{day}$ )

of reclaimed water. Additionally, with plants in various stages of design, construction, or readiness for operation, the total anticipated daily capacity of reclaimed water is expected to reach 105,000  $\text{m}^3/\text{day}$ .

To build a resilient urban environment, MAA has successfully completed the planning of system networks of common utility ducts for Taipei, New Taipei, and Kaohsiung cities, with a combined population exceeding 9 million. In addition, MAA has been pioneering in digital development and application of smart technology in the field of civil engineering. Practical cases include the Smart Electric Toll Collection System for Highways, Building Information Modeling (BIM) for railway, buildings and pipelines, development of mobile device for construction supervision, three-dimensional smart query and management for underground utilities, personal protective equipment (PPE) for construction safety, and the others.

In 2023, MAA introduced its own Environmental, Social, and Governance (ESG) criteria and practices. This initiative, beyond reducing operational risk, aims to create new business opportunities and meet the expectations of social responsibility. The implementation of ESG is envisioned as the next milestone, demonstrating the company's dedication to sustainable development.





**What strategies does MAA employ to stay at the forefront of technological advancements, ensuring that its professionals remain well-equipped to tackle the challenges of the ever-evolving digital landscape in civil engineering?**



MAA has been focusing on innovation, a core value established since the founding of the company, and actively implementing support measures. The approaches adopted for achieving technological advancements and ensuring readiness for challenges can be summarized as follows:



Our pioneer in engineering practices can be demonstrated by a latest project involving safety evaluation for Taiwan High Speed Rail. To identify geology and hydrogeology hazards, the satellite technology InSAR with GNSS was introduced for measuring ground deformation and providing accurately positioned information for the geological slope survey required to cover a large area.

MAA places strong emphasis on collaboration with academia. Recent examples include the research projects on application of UAV for land development, automated computation for construction progress, application of AI for deep excavation, and others. In addition, to further enhance the collaboration, MAA regularly offers a full semester seminar and a capstone course at National Yang Ming Chiao Tung University and National Central University, respectively. The lectures or capstone course are delivered by senior engineers or project managers with various disciplinary. While the seminar aims to provide students with perspectives and insights into engineering practice, the capstone course offers them the

opportunity to apply their knowledge and skills to real-world problems, simulating challenges and complexities they may encounter in professional settings.

MAA actively encourages its engineers to document and present insights and learnings derived from their practices. Since the 1970s, more than 600 technical articles have been published in various conference proceedings, journals, and technical magazines. Demonstrating a consistent willingness to share its development and progress, MAA actively engages with both the engineering community and academia.







**Looking beyond the immediate future, how do you see the synergy between artificial intelligence, BIM, and data analytics shaping the way civil engineering professionals approach their work in the coming decade?**



From our perspective, the synergy of BIM, data analytics, and artificial intelligence is poised to trigger a paradigm shift in the field of civil engineering. We anticipate that in the immediate future, more efficient, sustainable, and intelligent approaches will emerge, transforming our work in the following aspects.

#### Planning and design

Comprehensive digital representation through BIM, optimization utilizing artificial intelligence, and the identification of patterns and trends with data analytics will collectively contribute to achieving more efficient and sustainable development.

**BIM**

#### Maintenance

These technologies will facilitate the development and implementation of a proactive approach to assess the performance of assets over time, predict maintenance needs, mitigate costs, reduce downtime, and extend the lifespan of assets.



#### Construction

The synergy of technologies, including robotics, drones, automated control, image recognition techniques, and real-time monitoring, is anticipated to further enhance efficiency and safety in our operations.



#### Collaboration and Communication

The integration of BIM with AI and data analytics will be utilized to facilitate seamless communication and collaboration among clients, designers, contractors, and third parties.



#### Project management

The integration of these technologies will enable the monitoring and control of schedule and budget. Issues such as potential delays, resource allocation, interface conflicts, and design changes will be predicted and analyzed under this synergy. This foresight allows for the implementation of necessary measures in advance, optimizing the overall performance of the project.



#### Decision making

The synergy of these technologies will be applied to analyze data generated by BIM modeling, construction activities, and infrastructural systems, providing crucial information for informed decision-making.



The synergy of AI, data analytics, and BIM enables civil engineers to continuously refine their approaches over time, fostering ongoing improvement and innovation in civil engineering practices. However, it is crucial to bear in mind the importance of avoiding excessive dependence on AI and data analytics and the role of engineering judgment should remain as crucial as ever.

# DIGITALIZATION

## BIM + CARBON EMISSION CALCULATION APPLICATION

Taiwan has established the "Greenhouse Gas Reduction and Management Act," targeting a reduction in greenhouse gas emissions to 50% below the 2005 level of 245 million tons by 2050. To achieve this, effective carbon reduction plans are being sought through carbon footprint inventory. The Public Construction Commission is also aligning with national policies, actively promoting domestic public works with 'energy conservation and carbon reduction' as the core. This includes implementing practices across all engineering stages—planning, design, construction, and operation—that conform to energy conservation and carbon reduction standards, integrating green energy equipment.

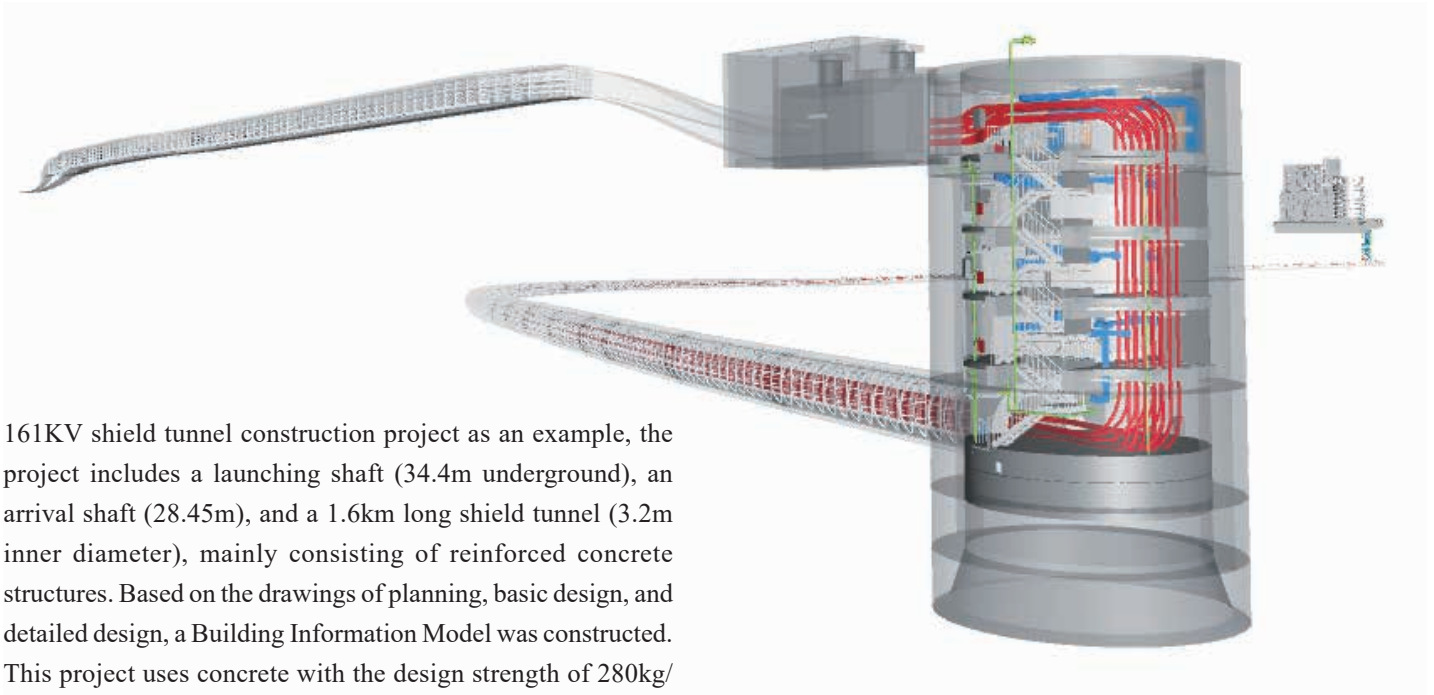


Large-scale deep excavation and shield tunnel excavation, however, lead to higher urban carbon emissions. To comply with policy goals and the objective of carbon management throughout the engineering lifecycle, Building Information Modeling (BIM) is being applied to pre-calculate the generated carbon emissions of structures during the design and planning stages. This ensures construction projects meet carbon emission standards, achieving sustainable engineering goals of enhancing functionality, reducing impact, and conserving energy.

Embodied carbon refers to carbon emissions related to building materials, which can be evaluated by choosing appropriate materials and specifications during the design phase. This includes using low-carbon materials, adopting low-carbon construction methods, and considering alternatives to reduce embodied carbon. The general method used to assess greenhouse gas emissions is the Emission Factor Method, calculated as: Greenhouse gas emissions (expressed in CO<sup>2</sup> equivalent) =  $\sum$ (Emission Intensity  $\times$  Emission Factor), where Emission Intensity includes oil, electricity, water usage, and material consumption, and the Emission Factor represents the greenhouse gas emissions per unit of emission activity (calculated in CO<sup>2</sup> equivalent).

Globally, about 40% of annual carbon dioxide emissions come from buildings, with concrete, steel, and iron accounting for 23% of total global emissions. Taking the Zhongshan D/S





161KV shield tunnel construction project as an example, the project includes a launching shaft (34.4m underground), an arrival shaft (28.45m), and a 1.6km long shield tunnel (3.2m inner diameter), mainly consisting of reinforced concrete structures. Based on the drawings of planning, basic design, and detailed design, a Building Information Model was constructed. This project uses concrete with the design strength of 280kg/cm<sup>2</sup>. Using the Environmental Data Open Platform of the Ministry of Environmental, carbon footprint emission factors for various groups were queried and corresponding parameters were added to the BIM model. Carbon factor data fields were added in the component categories, and carbon emission calculation conditions were set in the schedule to estimate the total carbon emissions for that category. Currently, this case only uses concrete for calculation and estimation, while carbon footprint emission factors for other categories can be searched on the Environmental Data Open Platform to help architects check the carbon emissions of design schemes and conduct more accurate assessments.



Currently, the project at the detailed design stage only includes preliminary calculations of carbon emissions for concrete materials, making it impossible to compare and evaluate different design options. It is recommended to apply this approach during the tender preparation and initial planning stages in the future. Additionally, since carbon coefficients vary by agency/institution and year, the results will differ. Further confirmation of parameters applicable to the local environment will be necessary. In light of the global emphasis on energy conservation and carbon reduction, energy efficiency and carbon reduction in public works will be included as a key item in overall planning. By utilizing BIM to collect building information and material data, along with carbon emission calculation approach, it's possible to pre-evaluate embodied carbon emissions during planning and design phases. The simulation and visualization of BIM allows for exploration of carbon reduction strategies and material alternatives, improving design efficiency and reducing later costs. Establishing Green BIM practices contribute to the sustainable development of public works while actively supporting environmental protection and long-term energy conservation and carbon reduction goals.



## 1.AUGMENTED REALITY INTEGRATION IN NEW TAIPEI CITY'S SMART PIPELINE SYSTEM

As urbanization accelerates, managing the increasingly complex underground pipeline systems has become more challenging. To address this, the New Taipei City Government has implemented a 3D smart pipeline inquiry and management system enhanced with AR technology. This system leverages IoT to provide real-time updates and displays, significantly improving management efficiency and response speed.

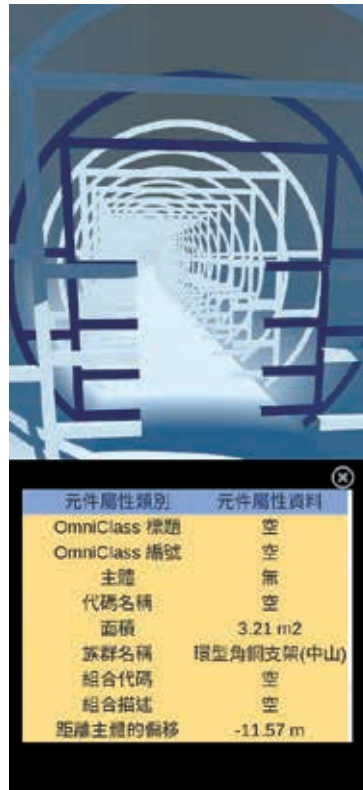
The AR mobile module allows staff to use smartphones or tablets to view and interact with 3D models of underground pipelines on-site. By scanning surface equipment with the AR app, users gain immediate access to maintenance history, technical parameters, and more, ensuring data accuracy.

Users can install the AR app on Android or iOS devices by following the respective platform instructions. The app's interface offers various modes, such as general positioning, single access cover positioning, and double access cover positioning. In the AR view, users can directly visualize the underground pipeline structure and query pipeline or case details through touch controls. The AR module supports multiple positioning technologies to ensure work accuracy.



## 2.BIM APPLICATION OF AUGMENTED REALITY FOR CONSTRUCTION SITE MONITORING

Augmented Reality (AR) technology has surged in popularity in recent years, seamlessly blending real-world environments with virtual elements using GPS positioning techniques. This technology remains a pivotal focus in current application development efforts. In the realm of Building Information Modeling (BIM) for construction site monitoring, the integration of AR technology significantly enhances efficiency and accuracy. By projecting the approximate locations of facilities on smartphones or tablets, users can access site-specific data or view equipment status through AR technology upon arriving at designated locations. This approach not only makes managing underground or difficult-to-access facilities easier but also enhances the interactivity and intuitiveness of on-site operations, greatly improving the value of facility management applications.





## AUTOMATED PROGRESS ANALYSIS SYSTEM USING UAV AND AI TECHNOLOGIES IN URBAN DEVELOPMENT ENGINEERING

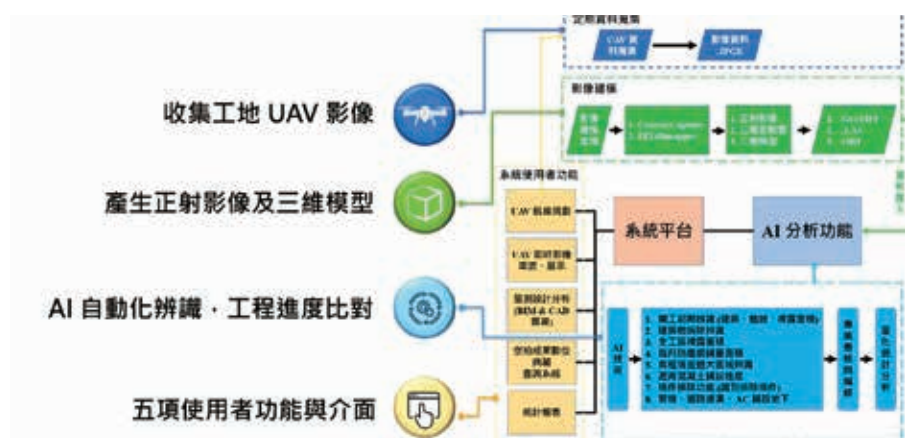
In traditional urban development projects, progress management often lacks data-driven information to verify the execution progress of various tasks, which can complicate project oversight. MAA has widely applied UAVs to collect on-site imagery, documenting the project's evolution across various stages. Through AI-powered image recognition technology, we analyze these images to accurately assess the current state of the construction site, providing a precise understanding of project progress. By automating the comparison process through UAV-captured imagery and AI image recognition, we ensure clarity in assessing site status and development outcomes."

Our application primarily focuses on developing six major AI comparison functions and constructing a robust system platform. This platform integrates AI technology with various types of map data, automating tracking and assessment for specific tasks and objectives to improve the precision and quality of task execution.

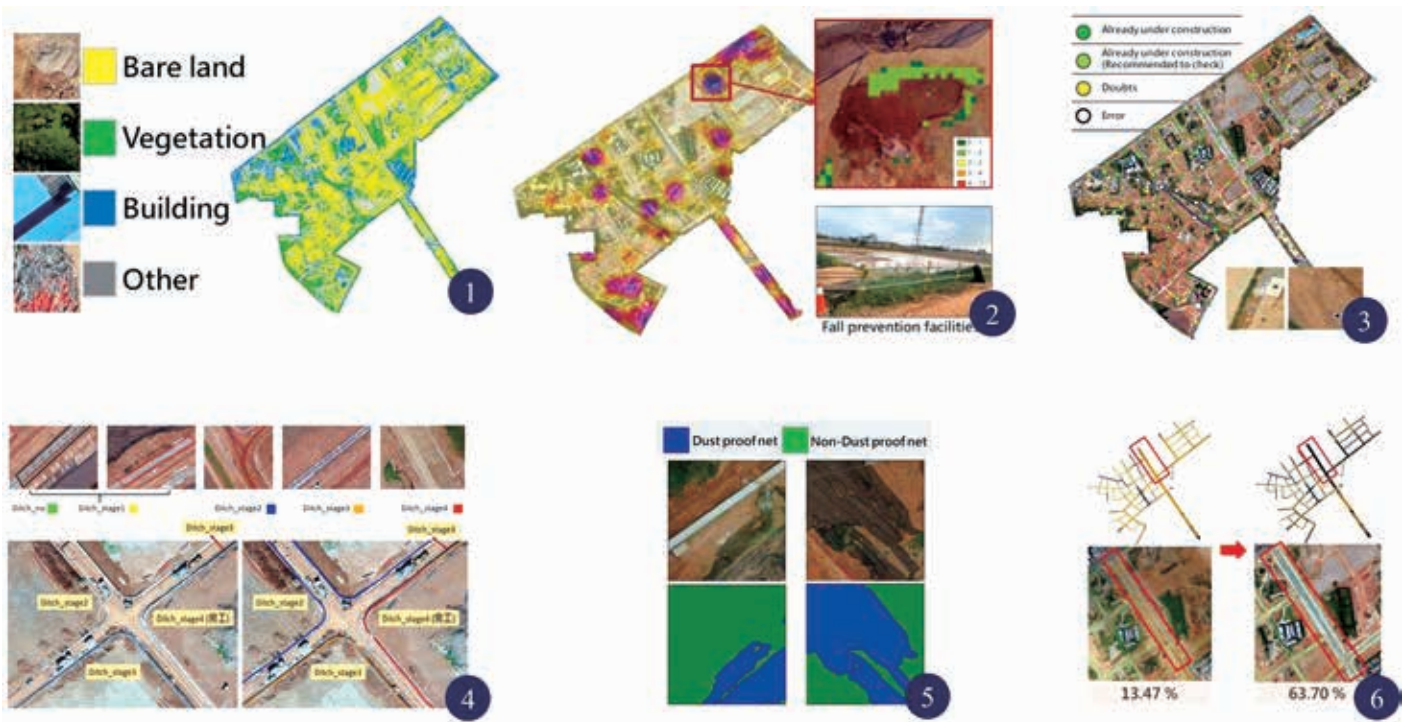
To advance the application of automated UAV and AI progress analysis technology in urban development projects, we conducted research and testing at the Zhongli Sports Park expropriation project in Taoyuan City. Located in Zhongli District, Taoyuan City, the project spans approximately 72.97 hectares. The development plan aims to revitalize local industries by creating a green living zone rich in water features and forest-like environments, incorporating green and blue belts to establish a verdant sports park."

The digital innovation application process for this project begins with the collection of aerial imagery. These collected images are then integrated and processed before being analyzed and compared using the developed AI analysis system. The resulting comparison data is subsequently imported into the platform for data querying and storage. The entire automated progress comparison calculation and analysis workflow is illustrated in the accompanying diagram.

Currently, the project has developed six major AI technical analyses (as shown in Figure 4), including land overlaying change detection, elevation difference interpretation and warning analysis, automated pipeline project progress assessment, road and ditch construction progress evaluation, dust net cover recognition, and asphalt paving progress recognition. These functions assist in various construction management applications.







To integrate relevant data and provide quick display and query applications for urban development construction progress management, MAA has also established a 3D GIS system platform. This platform combines 3D GIS and BIM aerial data, offering essential functions such as map data integration, measurement, and statistical analysis reports. Additionally, it includes comprehensive management features necessary for effective urban development construction progress management.

To provide intelligent applications for land development progress control, we collect comprehensive on-site imagery, import images from different periods into the AI model training database to enhance analysis accuracy, and optimize the AI analysis modules based on feedback from construction management experience. This rapidly assists in on-site construction management. Moreover, the UAV aerial photography and AI analysis



comparison operations only take one to two days, quickly summarizing the progress of various professional constructions, significantly reducing the manpower needed for on-site progress confirmation, and identifying potential safety risks, thus enhancing safety quality. Additionally, the established map platform can incorporate digital archives of construction images and analysis, accurately recording the construction process.

Furthermore, the established map platform can incorporate digital archives of construction images and analyses, accurately recording the construction process. Through this innovative application technology, we aim to achieve intelligent construction site management, ensuring quality standards, on-schedule progress, budget adherence, a pristine environment, and enhanced safety.

# SUSTAINABILITY

## ANALYSIS OF SDGS IN EFFLUENT WATER RECYCLING PROJECT

MAA operates under the core values of **‘Ethics, Responsibility, Dedication and Innovation’** established by MAA co-founder, the late Dr. Za-Chieh Moh. In response to global energy conservation and carbon reduction trends over the past decade, as well as guided by the company's core values, MAA has continuously collected the latest information on sustainable development, carbon reduction technologies, and related studies. The company has brainstormed innovative energy-saving and carbon-reducing measures, incorporating them into every project plan in accordance with SDG principles. This ensures that projects achieve environmental integration, ecological friendliness, and sustainable development outcomes. MAA's extensive experience in sustainable development, coupled with its innovative approaches to energy efficiency and carbon reduction, is deeply embedded in the company's corporate culture and applied across various projects.

This article uses 2017 ‘Turnkey Project for Yongkang Tainan Water Recycling Center’ project (hereinafter referred to as the Water Resource Center and Reclaimed Water Plant) as a case study. It explains how design concepts and strategies conforming to SDGs were implemented under various operational constraints such as project characteristics, functional requirements, legal regulations, and work schedules. Additionally, it details the corresponding SDG goals addressed and the benefits derived from these initiatives.

Taiwan's annual rainfall is approximately 2500mm, three times the world average. the steep mountainous terrain makes rainwater storage challenging. In recent years, climate change has exacerbated differences in rainfall patterns between the wet season (May to October) and the dry season (November to April), leading to uneven distribution of water resources. In addition to building reservoirs to regulate water resources, recycling and reusing effluent from public sewage treatment plants has long been a key sustainable development policy of government departments.





This project is located in Yongkang District, Tainan City, covering an area of approximately 9.67 hectares, with around 2.36 hectares dedicated to water purification facilities. The receiving water body is the Yanshui River. The project is divided into three main components: 1. construction of the Water Resource Center, 2. construction of the Reclaimed Water Plant, and 3. water supply pipeline and distribution engineering. The project aims to establish a modern water resource recovery and reclaimed water treatment plant, create a water resource environmental education park that integrates environmental protection, landscape, ecology, education, recreation, and provide a stable water source for industries.

The project was designed and planned according to sustainable development goal principles, achieving alignment with SDGs 6, 7, 9, 11, 13, and 14. Key initiatives include:

1. Effluent water recycling and reuse (SDG 6: Clean Water and Sanitation)
2. Energy-efficient lighting and solar power generation (SDG 7: Affordable and Clean Energy)
3. Green building planning for the Water Resource Center and Reclaimed Water Plant construction (SDG 9: Industry, Innovation and Infrastructure; SDG 11: Sustainable Cities and Communities; SDG 13: Climate Action)
4. Treated water discharge into the Yanshui River (SDG 14: Life Below Water)
5. Sludge reduction and use of anaerobic digestion biogas for energy supply (SDG 7: Clean Energy)
6. High-efficiency aeration equipment to save electricity costs (SDG 13: Climate Action)

These measures collectively contribute to sustainable development and demonstrate the project's commitment to environmental protection and energy efficiency.

The main design features and corresponding SDG items are briefly described as follows:

#### 1. Reclaimed Water Production (SDG 6: Clean Water and Sanitation):

Upon completion, the Water Resource Center and Reclaimed Water Treatment Plant will produce 8,000 m<sup>3</sup> of reclaimed water daily in the first phase, becoming Taiwan's first reclaimed water plant supplying high-tech industries.

#### 2. Energy Efficiency and Renewable Energy (SDG 7: Affordable and Clean Energy; SDG 13: Climate Action):

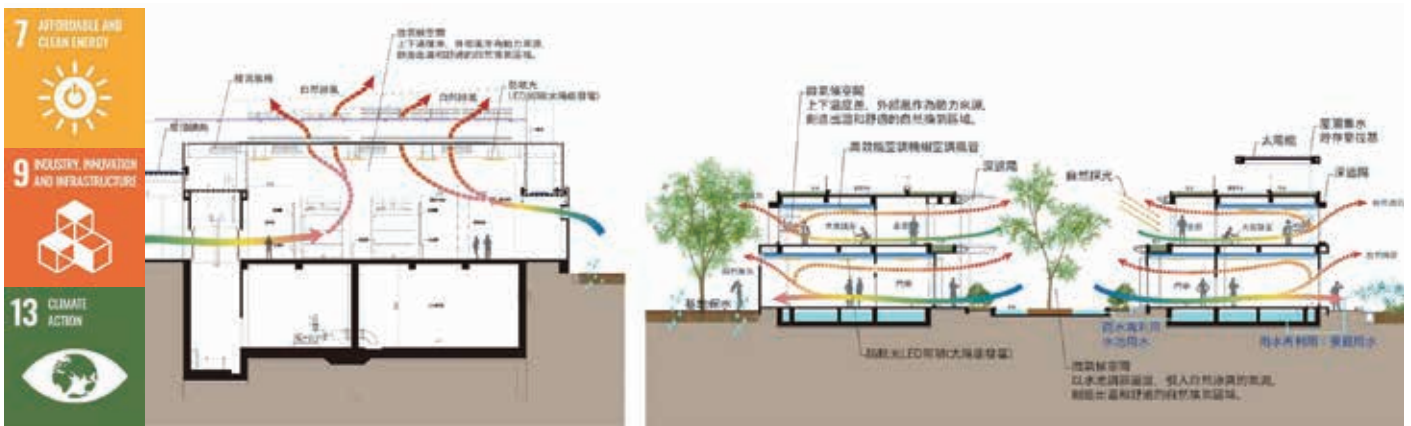
The entire plant is equipped with sensor-based LED or T5 lighting fixtures. Solar panels are installed on the roof of the reclaimed water plant, and large green spaces are preserved on the ground except for necessary paved roads.



**3. Green Building Certification (SDG 9: Industry, Innovation and Infrastructure; SDG 11: Sustainable Cities and Communities; SDG 13: Climate Action):** The construction of the Water Resource Center and Reclaimed Water Plant follows green building principles, meeting seven key indicators: biodiversity, greening, base water retention, daily energy saving, indoor environment, water resources, and sewage/waste management. It has achieved gold-level green building certification.



Green Building Certification

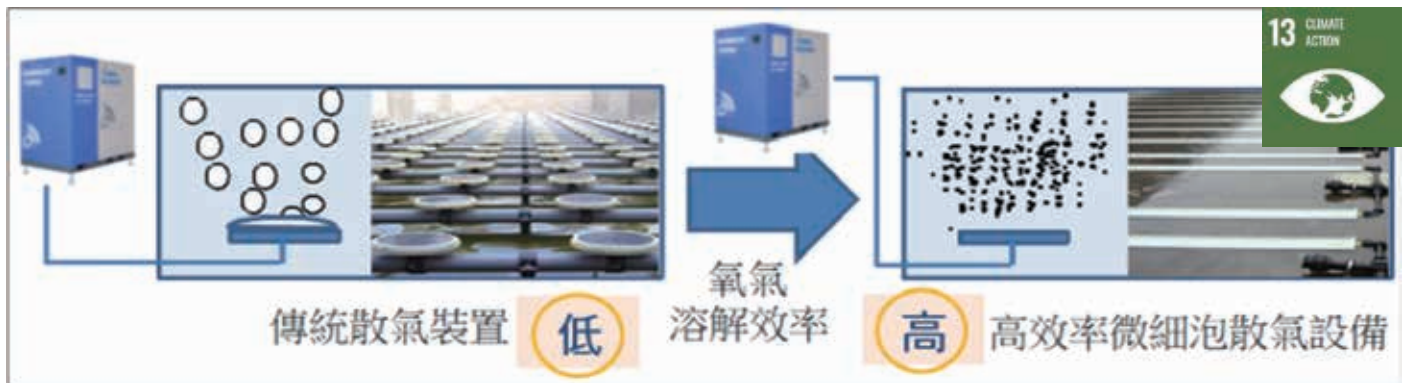


**4. Low Impact Development and Sustainable Sponge City (SDG 11: Sustainable Cities and Communities; SDG 14: Life Below Water):** The plant incorporates Low Impact Development (LID) concepts, implementing the "Sustainable Sponge City" approach, which enhances the city's flexibility in adapting to environmental changes and natural disasters. This approach ensures the absorption, storage, infiltration, purification, and release of water. The biological treatment system ensures treated effluent meets regulatory standards before being discharged into the Yanshui River, maintaining stable water quality and reducing the environmental burden on river ecosystems.



**5. Energy Savings and Carbon Reduction (SDG 13: Climate Action):** The biological pool utilizes high-efficiency diffuser plates to enhance oxygen transfer, saving 1 million kWh of electricity annually. Using the 2023 power carbon emission factor of 0.494 kgCO<sub>2</sub>e/kWh, this reduces carbon emissions by 494 tons.





**6. Sludge Reduction and Biogas Utilization (SDG 7: Affordable and Clean Energy):** The Membrane Bioreactor (MBR) and drying equipment reduce sludge treatment by 1.3 tons (dry weight) per day compared to the original design, representing an approximately 80% reduction in sludge volume. This reduces the energy required for sludge treatment. Additionally, biogas from anaerobic sludge digestion is used as an energy source for the sludge dryer.



This case study clearly demonstrates that by incorporating sustainable development goal principles into the project bidding stage, including low-carbon materials, energy-saving and carbon-reducing measures, and green building design and planning, bidding competitiveness can be enhanced. During the project execution phase, these practices resulted in cost savings, shortened timelines, and stable quality.

This case proves that businesses adopting SDG principles and goals can achieve smoother operations, improved service quality, and increased work efficiency, gaining numerous advantages in market competitiveness.



# OTHER NEWS

## 2024 OUTSTANDING INDUSTRY-ACADEMIA COLLABORATION AWARD



MAA Group has been bestowed the Excellence in Industrial-Academic Collaboration Award by the Chinese Institute of Engineers (CIE). This accolade recognizes outstanding teamwork in fostering innovation through industry-academia partnerships, significantly advancing industry practices and societal impact.

### Bridging the Academic-Industry Gap

MAA Group places great emphasis on nurturing the next generation of engineers. In 2023, the company forged partnerships with leading universities including National Yang Ming Chiao Tung University, National Central University, and National Taiwan University of Science and Technology. Through hands-on courses and internships, students gain essential workplace skills, exposure to the cutting-edge engineering practices, and insights into complex industry challenges and solutions. Upon completing internships, outstanding students are offered employment opportunities at MAA Group, enabling a seamless transition from academia into the workforce.

Understanding the importance of global perspectives, MAA Group maintains strong ties with renowned international institutions like the Asian Institute of Technology in Thailand. Furthermore, MAA Group actively contributes to enhancing engineering education. Over the years, the company has invested over NT\$5 million in funding academic associations, supporting public welfare activities and scholarships for outstanding and underprivileged students.



### Sustainable Engineering Meets Digital Innovation

Upholding the principle of 'integrity', MAA Group is committed to delivering professional services. As global economic growth drives increasing project diversity and complexity, the company embraces circular economy practices and sustainable engineering. Throughout project lifecycles, MAA Group integrates green communication, design, and culture into its business practices. By leveraging digital engineering, MAA Group enhances the quality and efficiency of engineering management.

In 2023, MAA Group collaborated with National Taiwan University to develop the "Automated Progress Analysis System using UAV & AI for Urban Development Projects," enhancing construction progress management. Partnerships with Tamkang University led to the creation of a "Project Management Information System." Additionally, MAA Group teamed up with National Cheng Kung University to develop an "AI-Based Deep Excavation Design Evaluation Tool" for rapid evaluations and design verification in deep excavation projects. Moreover, MAA Group worked with National Taiwan Ocean University to develop a "Noise and Vibration Assessment System for Civil Engineering Design-Build Projects," which assesses environmental impacts and proposes control measures.

MAA Group's ongoing innovation in the research and development of digital and intelligent engineering, solidifying its role as an invaluable asset to its clients and ensures its continued success in providing professional services.

### Commitment to Sustainability

Under the leadership of Chairman Richard Moh, MAA Group is steadfast in its commitment to achieving net-zero carbon emissions while making substantial contributions to sustainable development. Richard together with his management team will uphold core engineering values, striving to enhance societal well-being amid technological disruptions and a rapidly changing world. Their unwavering dedication ensures MAA Group's capacity, sustainability, and lasting positive impact.



*Outstanding Industry-Academia Collaboration Award*



*MAA's Senior Manager Chung-Ren Chu Attended the Award Ceremony*

## MAA ENGINEERS VOLUNTEERED IN ASSESSING DAMAGE FROM HUALIEN EARTHQUAKE

On 3<sup>rd</sup> April, 2024, at 7:58 AM, a 7.2 magnitude with a focal depth of 15.5 kilometers earthquake, struck the eastern coast of Taiwan. Hualien County experienced the strongest tremors, reaching a magnitude of 6 on the intensity scale. Taipei and Taoyuan experienced a lesser intensity of 5, while Taichung and Tainan reached a level 4. The earthquake resulted in temporary disruptions in high-speed rail and metro services, the closure of several bridges and roads, and widespread damage to buildings. This earthquake marks the largest in Taiwan since the 921 Earthquake in 1999.

In response to this emergency, the Taiwan Professional Civil Engineers Association promptly formed a response team to assist with disaster relief efforts in the severely affected areas of Hualien. Engineers collaborated closely with local governments to conduct emergency assessments of damaged buildings. These evaluations focused on critical aspects such as building tilt, damage to beam & columns, structural walls, ground subsidence, slope movement, and falling-object hazards. The primary goal was to determine whether buildings should be temporarily evacuated to prevent further loss of life and property.

Under Chairman's instruction, MAA swiftly mobilized its resources to support the relief efforts. MAA Senior Vice President, Daniel Lee, coordinated the deployment of seven professional engineers from various departments to join the response team. MAA's volunteer engineers diligently assessed residential buildings, schools, and other structures in Hualien, providing crucial consultations to ease public concerns. For buildings deemed unsafe, they offered detailed explanations and follow-up information to local authorities, ensuring transparency and prioritizing public safety.



In total, the Taiwan Professional Civil Engineers Association handled 596 assessment cases in Hualien, with MAA engineers contributing significantly by participating in 58 of these assessments. Throughout the process, our engineers demonstrated professionalism and dedication, reflecting MAA's commitment to social responsibility.

MAA is committed to continually enhancing disaster prevention capabilities to address the increasing frequency of complex disasters due to extreme weather. Our goal is to ensure public welfare and social stability, reinforcing our dedication to serving communities in times of need.



## 2023 AIT GTE ALUMNI GET-TOGETHER DINNER



A group photo of the GTE Alumni Get-Together 2023



Dr. Moh, together with Mr. Moh, Dr. Brand, Mrs. Brand and Prof. Nelson, Mrs. Nelson, and Ms. Vatinnee



A group photo of the GTE Alumni Get-Together 2023

The 2023 Alumni Get-Together Dinner of the Geotechnical and Earth Resources Engineering (AIT-GTE) program at the Asian Institute of Technology was held on 26<sup>th</sup> October during the 21<sup>st</sup> Southeast Asian Geotechnical Conference at the Centara Grand & Bangkok Convention Centre. Dr. Moh, Dr. Brand, and Prof. Nelson hosted this significant annual event.

The evening began with a group photo of the participants, followed by an opening speech by Dr. Noppadol Phenwej. Dr. Geoff Chao and Dr. Avirut Puttiwongrak then highlighted notable recent activities within the GTE program. Heartfelt moments unfolded as former faculty member Dr. Seah Tian-Ho and alumni representatives from the classes spanning 1970 to 2001 took turns sharing their memories and reflections on their time at GTE. The evening concluded with a closing speech by Dr. Warakorn Mairaing, leaving unforgettable memories for all attendees.



## MAA ENGINEERING PRACTICE COURSE AT ASIAN INSTITUTE OF TECHNOLOGY

For the second year in a row, the Asian Institute of Technology (AIT) invited Moh and Associates, Inc. (MAA) to offer the course titled 'Challenges in Applying Engineering Principles in Practice' at the Geotechnical and Earth Resource Engineering program (GTE). As with the previous year, this two-credit course was conducted in person and delivered intensively from Monday to Friday, running from June 10 to June 28, 2024. Dr. Hsiao-chou Chao, head of Advanced Engineering Unit of MAA, was appointed by the company as the instructor for this course.

This course consists of three parts: lectures, a site tour, and a term project. The class began with a lecture titled 'Our World, Our Work,' which provides the mindset, fundamentals, knowledge, skills, attitudes, values, and actions required of a civil engineer. The lecture content was summarized from Dr. Za-Chieh Moh's papers and lectures over the past decades. The other ten lectures focused on four main themes: bored tunnels, deep excavation, pile foundations, and engineering risk management. The case studies presented were selected from representative projects where MAA played a crucial role as either general or specialty consultants. Figures 1 and 2 show photos of the class in session and the participating students, respectively.

Contracts 1 and 2 of the Bangkok MRT Purple Line were selected for the site tour of this course, with support from the project's authority, the Mass Rapid Transit Authority of Thailand (MRTA); the project and construction management (PCM) team, MAA Thailand (MAAT); and the general contractor, CKST-PL Joint Venture. These two contracts cover a distance of 11.3 km and include six underground stations, cut-and-cover tunnels, and bored tunnels, which are scheduled for completion in 2026. Figure 3 shows Dr. Chao and Professor Geoff Chao, the AIT Head of Civil and



*The Class in Session*



*The Participating Students of the Class*



*Pre-Tour Meeting*





Group Photo of AIT Faculties, Staffs, Students, and MRTA, MAAT, CKST-PL Personnel



Group Photo of all in the Final Presentation

Infrastructure Engineering, expressing their gratitude to MRTA, MAAT, and CKST-PL in the pre-tour meeting. Figure 4 shows the group photo of the faculty, staff, students, and personnel of the authority, PCM, and contractor at the site.

The term project required students to predict the additional height of fill needed to cause stability failure of a test embankment, estimate the minimum and maximum values of this height, and determine the likelihood of the measured value. The students' predictions were compared to the actual measured height at failure and to predictions made by experts from the literature. A group presentation was arranged in the final class, where students were divided into three groups. Each group presented the conclusions of their term projects, findings from the site tour, and key takeaways from the lectures. Figure 5 shows the group photo of the class at the final presentation.

Through class participation, term projects, and group presentations, the students demonstrated their numerical ability in addressing slope stability problems using a probabilistic approach, exhibited their strong geotechnical background in site characterization and analysis, and showed their passion for exploring real-world underground construction. Just as the students expressed their gratitude to MAA on the AIT-GTE Facebook page, MAA is also pleased to thank the students, faculty, and staff for their hard work and commitment to this course.

# PROJECTS

## PROJECT MANAGEMENT AND CONSTRUCTION SUPERVISION TECHNICAL SERVICES FOR THE TAOYUAN MRT GREEN LINE EXTENSION TO ZHONGLI CONSTRUCTION PROJECT



In recent years, Taoyuan City has experienced significant industrial development and population growth. To enhance connectivity between Taoyuan City and the Greater Taipei area and alleviate traffic congestion in Taoyuan's metropolitan area, the city has implemented a "Three Cores, Six Lines" MRT network policy. This policy focuses on three major metropolitan areas - Taoyuan, Zhongli, and Aerotropolis - and connects them with six lines: the Airport MRT, Green Line, Green Line Extension to Zhongli, Brown Line, Sanying Line Extension to Bade, and the Taoyuan Railway Underground Project.

The 'Taoyuan MRT Green Line Extension to Zhongli' project is an extension of the Taoyuan MRT Green Line, connecting G01 station of the Green Line with the Airport Line's A23 station. This extension aims to form a comprehensive circular MRT network and improve the overall accessibility of Taoyuan City's transportation network.

The project route begins at G01 station of the Green Line in Bade District and runs along Jiande Road to a newly constructed road at Kanding Road. It then follows Zhongshan East Road, Huanzhong East Road, Longgang Road, and Jianxing Road to the Airport Line's A23 station. Six stations will be built: GE01(G30), GE02(G29), GE03(G28), GE04(G27), GE05(G26), and A23+(G25). GE01 will be an elevated station, while the others will be underground. The total length of the project route is approximately 7.2 kilometers, with about 5.3 kilometers underground (including daylighting sections) and 1.9 kilometers elevated.

In addition to the MRT stations, a depot covering an area of approximately 3.18 hectares will be constructed on east of the GE01 station. A connecting line will link the depot with the area between G01 and GE01 stations. At the terminus, the A23+ station will connect with the Airport Line's A23 station platform, facilitating easy transfers and integrating the Airport MRT Line with the Green Line.





MAA's scope of services for this project includes 'Project Management Consultancy', 'Construction Supervision', and 'Project Services'. The responsibilities encompass:



- Integrating the project implementation schedule
- Assisting the agency with various aspects of project construction, development, and pre-operation tasks
- Reviewing and approving detailed designs
- Supervising the construction of preliminary and main works
- Conducting supplementary geological investigations
- Managing land acquisition and related land use change procedures
- Performing pre-construction environmental impact assessments and monitoring
- Establishing project management systems
- Evaluating and formulating occupational safety and health designs
- Marketing and promoting project policies
- Implementing a Project Management Information System (PMIS)



## KAOHSIUNG METROPOLITAN AREA MASS RAPID TRANSIT SYSTEM- THE XIAOGANG-LINYUAN LINE

The Xiaogang-Linyuan Line of the Kaohsiung Metropolitan Area Mass Rapid Transit System is a major transportation infrastructure project initiated by the Kaohsiung City Government. This line connects Xiaogang and Linyuan, aiming to enhance transportation convenience in the southern region of Kaohsiung and promote regional economic development. The project spans approximately 11.59 kilometers and includes the construction of multiple new stations, featuring 6 underground stations and 1 elevated station.

### Highlights of the Project:

- **Convenient Travel:** Upon completion, the Xiaogang-Linyuan Line is expected to transport tens of thousands of passengers daily, significantly alleviating road traffic pressure and enhancing the travel experience for Kaohsiung residents.
- **Environmental Design:** The project incorporates the latest environmental technologies and green building elements within the stations, such as solar panels and rainwater harvesting systems.
- **Smart Transportation:** The entire line is equipped with a digital operation system, including real-time vehicle monitoring, electronic ticketing, and passenger information display systems, enhancing operational efficiency and passenger convenience.

### Alignment with UN Sustainable Development Goals (SDGs):



- **Goal 7 Affordable and Clean Energy:** The project extensively uses renewable energy, such as solar power, to supply electricity to the stations.
- **Goal 9 Industry, Innovation, and Infrastructure:** The construction of the Xiaogang-Linyuan Line enhances Kaohsiung's transportation infrastructure, supporting sustainable urban development.







- **Goal 11 Sustainable Cities and Communities:** The operation of this line will improve transportation convenience and safety in Kaohsiung, enhancing the quality of life for its citizens.
- **Goal 13 Climate Action:** By promoting the use of public transportation, the Xiaogang-Linyuan Line reduces reliance on private car travel, thereby lowering carbon emissions and helping to address climate change.

#### Sustainable Development Principles in Planning and Construction:

- **Low Carbon:** The project uses electric trains and strictly controls carbon emissions during construction.
- **Digitalization:** Comprehensive smart management is implemented, including digital ticketing systems and intelligent dispatch systems, improving operational efficiency and passenger experience.
- **Energy Efficiency:** The use of high-efficiency, energy-saving equipment and technology reduces energy consumption during operation.
- **Sustainability:** The project adheres to sustainable development principles from planning and design to construction and operation, aiming to create a model for green transportation.

The Xiaogang-Linyuan Line of the Kaohsiung Metropolitan Area Mass Rapid Transit System will become a modern and sustainable public transportation model, enhancing travel experiences for residents and contributing to the creation of a green Kaohsiung.



## TAIPEI MRT XIZHI-DONGHU LINE PROJECT

### Project Overview:

The project covers approximately 5.56 kilometers and includes 6 elevated stations and 1 depot



- Following the completion and operation of the Taipei MRT Neihu Line, Songshan Line, and the eastern extension of the Nangang Line, there was a need to meet the travel demands between the Minsheng community in Taipei's eastern district and the key areas between Neihu and Xizhi in New Taipei City. To address these needs and to distribute peak hour traffic more evenly across the east-west MRT routes, the Taipei City Government's Department of Rapid Transit Systems conducted a feasibility study for the Minsheng-Xizhi Line, which was approved by the Executive Yuan on 19<sup>th</sup> December, 2011.
- The project is divided into two phases: Phase 1 (Donghu to Xizhi) and Phase 2 (Neihu to Dadaocheng and Donghu branch line). Department of Rapid Transit Systems, New Taipei City Government conducted comprehensive planning for Phase 1, the MRT Xizhi-Donghu Line (referred to as the "MRT Xidong Line"), and the planning report was approved by the Executive Yuan on 13<sup>th</sup> January, 2023. Basic design work commenced on 21<sup>st</sup> March, 2022.
- This project aims to construct an MRT route between the Donghu area of Taipei and the Xizhi district of New Taipei City, providing direct MRT services to the Xizhi area.
- The project aims to enhance the investment environment, thereby driving the development of surrounding industries and urban planning. It will also increase land value along the route. This aligns with the policy of domesticating the rail industry to expand the achievements of the New Taipei City Government's domestic vehicle production initiative. To expedite the project and provide early service to the public, construction supervision will commence upon the completion of tender awards of the critical path project contract and the main Design-Build contract. Completion is expected in early 2032, with final completion slated for January 2033.





### Engineering Characteristics:

The basic design of the project incorporates various structural forms and construction methods to accommodate route alignment, site environment constraints, and construction traffic maintenance requirements. The elevated bridge spans a total length of 4,931 meters and consists of 152 bridge piers. The bridge structures are classified as follows:

- Standard bridges:** Pre-stressed concrete U-beams (34.9%) and pre-stressed concrete box girders (22.6%)
- Non-standard bridges:** Steel box girders (39.7%) and cantilever bridges (2.8%).
- Foundation types:** Pile foundations (75.7%), caisson foundations (22.6%), and box caisson foundations (1.7%).

**Engineering Benefits and Practicality:**

Aligning with the planning and basic design of "MRT Xizhi-Donghu Line Route Planning and Comprehensive Urban Development Plan for Surrounding Land" and the comprehensive planning of the "Commuter Rail Construction Plan between Keelung and Nangang," the project aims to promote the Taipei metropolitan area's MRT network by constructing an MRT route between the Donghu area of Taipei and the Xizhi district of New Taipei City. The Ministry of Transportation and Communications invited the mayors of Taipei, New Taipei, and Keelung to convene the "Northern Taiwan Rail Network Policy Communication Platform," where five consensuses were reached, three of which pertain to this project.

- The Keelung Light Rail will be upgraded to a medium-capacity MRT system.
- The Keelung MRT will integrate with the Taiwan Railways, High-Speed Rail, and Bannan MRT Line at Nangang Station in Taipei.
- To prevent the future scenario of having three lines and six tracks, the Xidong MRT will integrate with the Keelung MRT plan by adopting the same system and sharing tracks.

**Transportation Benefits:**

- The Xidong MRT will establish a route between Xizhi and Taipei's Neihu district, reducing commuting time by approximately 30 minutes.
- It is estimated to remove around 14,000 cars and 7,000 motorcycles from the roads daily.
- Over a 30-year operation period, it will reduce fuel consumption by about 175 million liters and cut carbon emissions by approximately 300,000 metric tons.





## PROJECT MANAGEMENT, SUPERVISION, AND SPECIAL SEISMIC MONITORING TECHNICAL SERVICES FOR THE NEW CONSTRUCTION OF ‘JINCHENG ANJU’ SOCIAL HOUSING IN EAST DISTRICT, HSINCHU CITY

### 1. Project Objectives

The National Housing and Urban Regeneration Center is dedicated to implementing social housing policies and achieving housing justice by building and operating social housing with a "rental-only" model. This initiative focuses on the efficient allocation and reuse of public resources, primarily addressing the housing needs of youth and vulnerable groups. The goal is to create high-quality residential spaces that serve diverse and public purposes. The objectives of the project are as follows:

- **Leverage Site Characteristics:** Develop unique spatial features that maximize the potential of the site's characteristics.
- **Sustainable Design:** Reduce maintenance and management costs through energy-saving and sustainable design practices.
- **Modular Construction:** Enhance construction efficiency and quality by employing modularization, thereby advancing construction industry technology.
- **Integrated Project Management:** Implement Building Information Modeling (BIM) for maintenance management and integrate it with the National Housing and Urban Regeneration Center's Project Management Information System (PMIS) for streamlined project oversight.



### 2. Project Overview

The service scope of 'Jincheng Anju' Social Housing New Construction Turnkey Project in the East District of Hsinchu City encompasses project management, supervision, and specialized seismic monitoring technical services. MAA and C.Y. Wang Architect & Associates jointly tendered the project, securing the award on December 7, 2023. The turnkey contractor was selected on March 28, 2024, with the expected completion date set for August 8, 2029.

### 3. Site Description

The site is situated in the East District of Hsinchu City, bordered by Jincheng 1st Road, Lane 40 of Jincheng 1st Road, and Jincheng 3rd Road. It encompasses the area and surrounding greenery of the former Jincheng New Village (previously General Village). The current site includes the General Village parking lot (park), Tank Park, and green spaces.

### 4. Site Use and Zoning

The project site encompasses social housing, landscape paving, and greening areas, covering 11 parcels with a total area of 15,025m<sup>2</sup> in the Guangfu Section of Hsinchu City.

## 5. Building Requirements and Planning

The project features an open-space outdoor design, providing park green spaces for the neighboring community. The residential areas are strategically planned in quiet corners of the site to reduce road noise and disturbance. The design incorporates green walkways, planting, natural ventilation, and lighting to minimize spatial pressure. Housing units are designed to offer the optimal balance of number of units, cost, and volume development, adhering to the "Social Housing Facilities and Equipment Items" regulations by the Construction and Planning Agency. These units are equipped with amenities such as living room and dining furniture, bed frames, wardrobes, curtains, bathroom facilities, kitchen appliances, clothes drying racks, water heaters, etc., ensuring a high-quality living environment. Public facilities include:

- **Public Facilities:** Includes an entrance lobby, mailbox area, parcel room, social space, garbage storage room, and parking spaces.
- **Public Welfare Facilities:** Features spaces for day activities for the disabled, a day care center for the disabled, an infant care center, and a community center for residents to interact and dine together, enhancing community functions.
- **Underground Parking Space:** Offers a separate lobby, designated lanes for cars and motorcycles, mechanical and storage spaces, parking management center, and additional three independent elevators for future operational needs, ensuring separate movement paths for social housing residents.

## 6. Turnkey Planning and Design

- **Construction Project:** The project aims to construct over 921 residential units, utilizing reinforced concrete (RC) structures with buildings ranging from 20 to 21 floors above ground and 3 floors underground.
- **Centralized Property Management Center:** This center will house a property management office, a parcel delivery room, a disaster prevention center, and a community meeting space. Its objectives include optimizing manpower for enhanced surveillance of residential lobbies, reducing maintenance costs, and fostering affordable and sustainable social housing.
- **Certification Design:** The project will serve as a demonstration base for Environmental, Social, and

Governance (ESG) principles, aiming to achieve Gold-level Green Building Certification, Bronze-level Intelligent Building Certification, Level 1 Building Energy Efficiency Certification, Seismic Design Certification (during the design phase), and Seismic Certification. The entire building will feature universal design principles.

- **Emergency Escape Routes:** Each building floor will feature clearly marked safety stairs and emergency escape direction indicators. Vertical routes will lead to outdoor open spaces on the ground floor, serving as emergency evacuation points and shelters, potentially accommodating neighborhood residents in need.
- **External Structural Review:** With plans for three underground floors and an excavation depth (including foundation) exceeding 12 meters, the project adheres to Hsinchu City's building permit requirements for special structural reviews.
- **Precast Construction Method:** Adopting precast construction methods reduces risks, shortens construction timelines, minimizes on-site waste, dust, and noise, and enhances overall construction quality. The housing design utilizes a precast exposed beam-column system with square interior layouts conducive to efficient furniture placement and space utilization.
- **Same-Floor Drainage:** The residential unit bathrooms are designed with same-floor drainage, resolving drainage issues locally on each floor to prevent resident disputes. This design facilitates repairs without impacting the main structure, minimizing noise and waste.
- **Automated Construction Safety Monitoring System:** The project integrates an automated construction safety monitoring system, the BIM 7D automated maintenance management system, and implements the energy management system, Mr. Energy, to enhance operational efficiency and safety.
- **Circular Economy Concept 5R:** Embracing the 5R principles of Reduce, Reuse, Recycle, Rethink, and Repair, the project adopts a circular economy approach. It emphasizes strategies such as using recyclable and circular building materials, resource recycling and reuse, waste resource utilization, and flexible module integration to foster sustainable development within social housing initiatives like Jin Cheng Anju.



## 7. Precast Construction Method

- **Precast Structure Construction:** Three buildings are constructed using columns, walls, and standard floor beams and slabs starting from the second floor upwards, repeating the cycle for each standard floor.
- **Precast Component Production:** Components are standardized, reinforced, cast, and cured in the precast plant, then transported to the site for installation.
- **Precast Component Segmentation:** Components are sized for production, storage, transportation, and installation, such as half-precast KT slabs, exterior wall panels, and beam-column segments.
- **Precast Component Connection:** Ensures proper design and positioning of joints, fixed during installation, using BIM for review and design.
- **Standard Floor Construction Period and Hoisting:** Three inner climbing tower cranes ensure for simultaneous hoisting, with flexible support between buildings to optimize construction time. Each standard floor cycle is estimated to take 16 working days.
- **Exterior Wall Waterproofing:** PE strips and waterproofing materials for primary waterproofing, with gaskets embedded for secondary waterproofing. Silicone sealing for external seams and PU for internal seams, with pressure relief space at interfaces.

## 8. Circular Economy and Sustainable Management Goals

The project aims to incorporate circular economy principles, optimizing construction methods and maximizing material reuse to achieve for zero waste and sustainable benefits. The project will also attain Seismic Design Certification, Seismic Certification, Golden Green Building Certification, Bronze Smart Building Certification, and Level 1 Building Energy Efficiency.



# PROFESSIONAL ACTIVITIES

## BRIDGES COLLABORATIONS OF TECHNOLOGY CENTER FOR DISASTER REDUCTION THE NATIONAL SCIENCE AND TECHNOLOGY CENTER FOR DISASTER REDUCTION AND ASIAN INSTITUTE OF TECHNOLOGY THE ASIAN INSTITUTE OF TECHNOLOGY ON DISASTER REDUCTION RESEARCH AND ITS IMPLEMENTATIONS

Technology Center for Disaster Reduction (NCDR) and Asian Institute of Technology (AIT)

On the afternoon of 1<sup>st</sup> October, 2021, Director Hongey Chen of the National Science and Technology Center for Disaster Reduction (NCDR) walked into Dr. Moh's meeting. Director Chen first briefly introduced the "Disaster Information Network" and its practical applications during typhoons in Taiwan. He also mentioned the achievements of promoting "Smart Disaster Prevention New Southbound" with the support of the National Science and Technology Council (NSTC). After listening to Director Chen's presentation, Dr. Mo recognized NCDR's achievements and believed that Taiwan's capability and experience in disaster reduction technology should be shared with the world, especially with the Southeast Asian region. Dr. Moh recommended the Asian Institute of Technology (AIT) in Thailand as a good partner for collaboration. Subsequently, through Dr. Moh's intermediation, NCDR and AIT gradually collaborated on disaster risk management.

On 17<sup>th</sup> November, 2022, through a video conference, NCDR Director C Hongey Chen and President Kazuo Yamamoto of AIT represented their respective sides in a Memorandum of Understanding (MoU) signing ceremony. The two parties signed a five-year cooperation agreement. NSTC Vice Minister Tzong-Chyuan Chen, who also serves as the Chairman of NCDR's Board of Directors, and Dr. Moh, Vice Chairman of AIT's Board, witnessed the signing ceremony on-site at NCDR (photos 1 to 3). The collaboration aims towards academic and practical cooperation, including installing a disaster monitoring system in northern Thailand and establishing a disaster information network.



Starting from the left, Chairman of Moh and Associates Richard Moh, Vice Chairman of the AIT Board of Director Dr. Za-Chieh Moh, NSTC Vice Minister Tzong-Chyuan Chen, NCDR Director Hongey Chen and Secretary General of National Science and Technology Center for Disaster Reduction Dr. Wei Sen Li



AIT President Kazuo Yamamoto (second from right), Professor Geoff Chao of AIT (second from left)

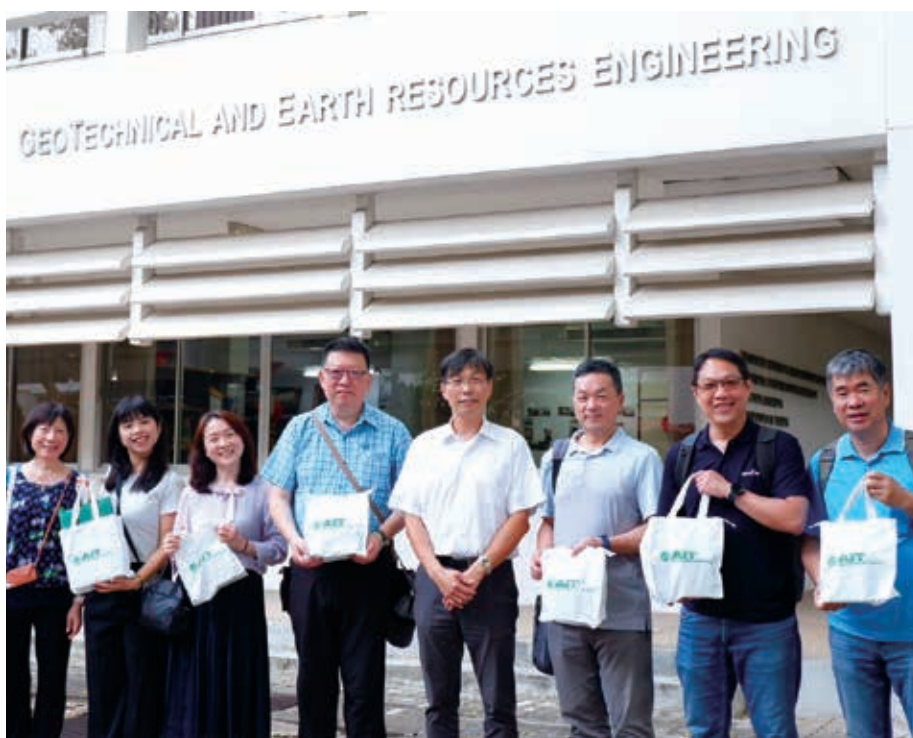


Starting from left, Chairman of Moh and Associates Richard Moh, Vice Chairman of the AIT Board of Directors Dr. Za-Chieh Moh; NSTC Vice Minister Tzong-Chyuan Chen; and NCDR Director Hongey Chen and Secretary General of National Science and Technology Center for Disaster Reduction Wei Sen Li





NCDR Director Chen Hongyu conducted acceptance checks and system tests on monitoring equipment in Chiang Rai and Professor Geoff Chao & Dr. Wei Sen Li inspected the system.



Group led by Professor Geoff Chao visited NCDR

On 21<sup>st</sup> March, 2024, Director Chen Hongyu led a team to the mountainous area of Chiang Rai Province in Northern Thailand (Photo 4) to conduct acceptance checks and system tests on monitoring equipment. The mountainous region of Chiang Rai Province in Northern Thailand frequently experiences landslides during the rainy season, and in May 2014, an extreme shallow earthquake of magnitude six also occurred. After discussions with AIT, it was decided to install a total of 10 sets of monitoring equipment, including P-Alert (a Taiwanese-made seismograph), rain gauges, anemometers (for wind speed and direction), and hygrometers (for temperature and humidity). After the system is completed, it will be used to analyze and research hydro-meteorological and geological disasters in the area. By introducing the experience from Taiwan's "Disaster Information Network," the project aims to facilitate cross-boundary cooperation and assist AIT in capacity building for the youth.

The disaster risk management collaboration between NCDR and AIT, which achieved preliminary results within three years, was primarily facilitated by Dr. Moh's mediation and promotion, making him one of the greatest contributors to the project. In recognition of Dr. Moh's contributions to talent cultivation and international cooperation, this collaborative project will continue, jointly advancing innovation in disaster reduction technology and its implementation.



## HIGHLIGHTS FROM THE SINGAPORE DELEGATION'S LANDMARK VISIT

In a landmark study tour of urban infrastructure, a group of 32 delegates from Singapore, led by the Infrastructure Planning Authority Group affiliated with the Urban Redevelopment Authority, visited Taipei and New Taipei City from the 18<sup>th</sup> to 22<sup>nd</sup> of March, 2024. The team comprised key personnel from government authorities in charge of utilities, along with representatives from various utility agencies.

MAA facilitated coordination between Singaporean government authorities and both the Taipei City Government and New Taipei City Government for this event.

The visit not only deepened the collaborative ties between Taiwan and Singapore but also provided an opportunity for both sides to exchange innovative ideas in infrastructure planning and utility management. Singapore's adoption of lessons learned from Taipei's mature systems is expected to play a key role in shaping the future of its urban development, paving the way for further cooperation in the region.





## ARCHITECTS KAZUYO SEJIMA AND RYUE NISHIZAWA INSPECT TAICHUNG GREEN MUSEUMBRARY. TAICHUNG MAYOR SHIOW-YEN LU EXTENDS GRATITUDE: CREATING A WORLD LANDMARK



*Taichung Mayor Shioh-Yen Lu led the City Government team, along with MAA's Senior Vice President Shih-Chang Huang, and Architects Kazuyo Sejima and Ryue Nishizawa, Inspected the Project*

‘**Taichung Green Museumbrary**’ is one of the significant constructions in Taichung City. As the city’s first building to fuse a library and an art museum, this landmark is poised to become a beacon of culture and innovation. On 29<sup>th</sup> March, 2024, Taichung Mayor Shioh-Yen Lu led the city government team, along with MAA's Senior Vice President Shih-Chang Huang, and renowned architects Kazuyo Sejima and Ryue Nishizawa, inspected the progress of this monumental project.





*Metal Expanded Mesh and Low-energy Glass Reduce Heat Load and Energy Consumption*



*Kazuyo Sejima*



*Ryue Nishizawa*

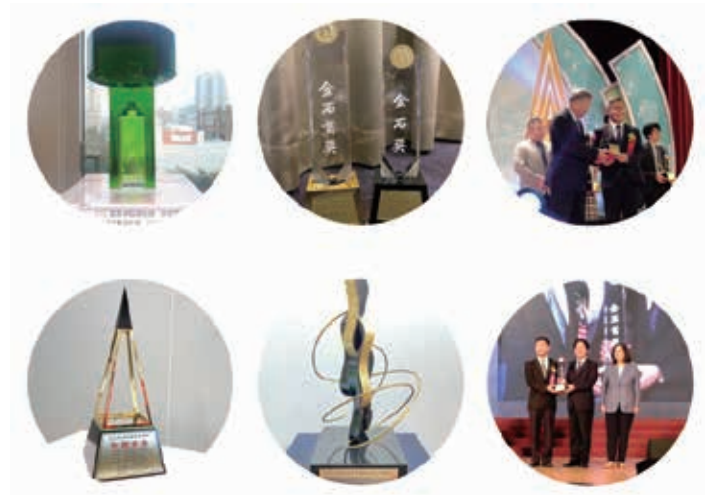
This project is the first architectural work in Taiwan by SANAA, the acclaimed Japanese architectural firm founded by Kazuyo Sejima and Ryue Nishizawa, winners of the 2010 Pritzker Architecture Prize. The design comprises eight interconnected buildings that form a dreamlike cultural complex nestled within Central Park. The project uses a shaped metal expanded mesh curtain design, which allows natural light and airflow to permeate the interior spaces during the day while enabling the indoor lighting to cast gentle glow outwards at night. This blend of functionality and aesthetics results in a visually transparent and elegantly artistic edifice.

Overseeing this project, MAA upholds the principles of 'innovation, human-centricity, and sharing'. The design emphasizes creating an inviting reading space to all ages, aligning with Shuinan's vision of an 'intelligent, low-carbon, and innovative' environment. Sustainable features such as metal expanded mesh and low-energy glass reduce heat load and energy consumption. High ceilings and strategic setbacks enhance natural ventilation, creating comfortable shaded plazas and reducing carbon emissions. Furthermore, the building incorporates the advanced Friction Pendulum System (FPS), similar to the one utilized in the Southern Branch of the National Palace Museum. This cutting-edge technology physically separates the ground and underground structures, significantly mitigating tremors during earthquakes, ensuring the safety of both people and property.



Despite the challenges posed by the COVID-19 pandemic, including delays in the production of seismic isolators in Italy, the dedicated teams at MAA have ensured the project stays on track. Through international cooperation and real-time online inspections, they have maintained the highest quality standards. The project has already garnered numerous accolades, including the 'National Excellence in Construction Award', 'Taichung City Public Construction Awards', 'Taichung City Occupational Safety and Health Awards', 'Taichung Urban Design Award', and 'Chinese Architecture Golden Stone Award'.

MAA continues to integrate sustainable design principles, such as: 1. Using seismic isolators to reduce the amount of steel used in the main structure. 2. Implementing aluminum expanded mesh to minimize sunlight exposure, thereby reducing heat load and air conditioning usage. These measures aim to achieve sustainable development goals. Architect Kazuyo Sejima has come to inspect this project twice, offering valuable suggestions such as optimizing the overall building's transparency to make the structure, environment, and people more seamless. Her vision is to create a 'library in the park, an art museum in the forest', combining ecology and culture to highlight Taichung's reputation as a city of culture.



Awards



Seismic Isolators

Guided by the suggestions from Architect Sejima during her previous visit on 4<sup>th</sup> December last year, including the incorporation of expanded mesh, ceiling adjustments, and an increase in transparent windows, MAA received an additional NT\$50 million funding from the Taichung City Government to facilitate these design enhancements. The second phase of specialized decoration and equipment installation commenced in December 2023 and is projected to be handed over to the Cultural Affairs Bureau for exhibition setup and book shelving by mid-2025, with an anticipated grand opening in December of the same year. Upon completion, it is anticipated to become not only a landmark in Taichung and Taiwan but also gain recognition as a global architectural icon, elevating Taichung's presence on the world stage.



## MAA WELCOMES DISTINGUISHED VISITORS FROM AIT TO STRENGTHEN ACADEMIC AND INDUSTRY TIES



*Dr. Sangam Shrestha (L) and Dr. Kuo-Chieh Chao (R)*

MAA was pleased to host Dr. Sangam Shrestha, Dean of the School of Engineering and Technology, and Dr. Kuo-Chieh Chao, Chair of the Department of Civil & Infrastructure Engineering, from the Asian Institute of Technology (AIT), Thailand on 19th March, 2024. The visit focused on reinforcing the industry-academia partnership between MAA and AIT.

Discussions revolved around several strategic initiatives aimed at enhancing the existing collaboration framework, establishing new internship opportunities for AIT students, launching an MAA-led lecture series at AIT, and exploring potential recruitment of AIT's class of 2024 graduates.



*Dr. Sangam Shrestha (L) and Chairman Richard Moh (R)*

MAA agreed to offer two internship positions in Geotechnical Engineering and Environmental & Water Engineering disciplines. AIT graduate students who have completed their first year are eligible to intern at MAA's Taipei Main Office from May to August. Additionally, MAA is set to host a 30-hour lecture series titled "Geotechnical Engineering Practice" every June at AIT, specifically designed for second-year graduate students.

This visit not only reinforced the longstanding collaboration between MAA and AIT but also set the stage for future academic exchanges and professional development opportunities, ensuring ongoing growth and mutual benefits for both institutes.



## GROUNDBREAKING CEREMONY FOR PROJECT MANAGEMENT AND CONSTRUCTION SUPERVISION FOR ELEMENTARY SCHOOL CAMPUS IN NANZI DISTRICT (WENXIAO 2 LAND) IN KAOHSIUNG CITY

The groundbreaking ceremony for the construction of Lantian Primary School in Nanzi District, Kaohsiung City, marked a significant milestone in the area's development. Driven by population and urban planning changes, this innovative project employs a design-build approach, aims to create a smart, energy-efficient, and sustainable educational facility. With plans to accommodate 48 classes and various educational spaces, the school integrates cutting-edge technologies, including a solar photovoltaic system and smart grid infrastructure, to power the campus with green energy and combat global warming by reducing carbon emissions. Furthermore, the project prioritizes environmental sustainability, targeting recognition with environmental certifications and emphasizing low-carbon, green energy, and smart campus features. Consideration is also given to ultra-low energy consumption and leveraging solar resources, aligning closely with the United Nations Sustainable Development Goals (SDGs).

MAA serves as the project management and construction supervision consultant, ensuring it meets its goals of creating environmentally friendly, technologically advanced, and energy-efficient buildings.

On May 7<sup>th</sup>, 2024, Kaohsiung City Mayor Chi-Mai Chen, Legislator Po-Yi Lee, MAA's SVP of Construction & Management Group Shih-Chang Huang, along with local councilors, came together to commemorate this auspicious occasion, marking a momentous step forward in the educational landscape of Nanzi District, Kaohsiung City.



*Kaohsiung Mayor Chen Chi-Mai and MAA's SVP Shih-Chang Huang Attended Ground-breaking Ceremony*



## KAOHSIUNG INDUSTRIAL HIGH SCHOOL PARKING GARAGE PROJECT PROMOTES SMART GREEN BUILDING SOLUTIONS



### Project Attributes

To address the insufficient parking space in urban areas, the Kaohsiung City Government Transportation Bureau has proposed the "Kaohsiung High School 3D Parking Lot" construction project. The project actively encourages schools at all levels to release on-campus parking spaces to create off-street public parking lots with exemplary effects to improve parking conditions. It includes the principles of smart parking facilities and eco-friendly design. Since the implementation of this policy, it has been widely recognized by the public for increasing local parking supply and addressing the issue of canceled parking spaces along the light rail route. Additionally, the outsourcing of parking lot operations to collect rent has achieved a win-win effect by benefiting the public and increasing municipal revenue.

### Design Concept and Desired Certification Items

The plan aims to meet the parking needs of surrounding commercial traffic by introducing smart, eco-friendly, and gender-friendly parking environments. This initiative will enhance the quality and usability of public parking facilities in Kaohsiung City, improve the community's landscape image, and obtain certifications for Green Building and Smart Building standards.

### Features

In response to green building design, the project facade incorporates wind direction designs to guide airflow, eliminating hot exhaust gases and increasing visual transparency. The project also features comprehensive route planning to reduce congestion commonly associated with parking lots, creating a highly efficient parking facility with seamless pedestrian, vehicular, and airflow. The design includes visually penetrable green hedges to maintain safety boundaries inside and outside the campus.

Compliance with UN Sustainable Development Goals (SDGs), Low Carbon, Digital, Energy Saving, and Sustainability Initiatives

The project aligns with the United Nations Sustainable Development Goal 9: "Industry, Innovation, and Infrastructure." It integrates the concepts of "aesthetic architecture," "environmentally friendly and safe," "ecological conservation," and "smart operation management" to achieve aesthetics, functionality, economy, and energy efficiency. This initiative aims to secure Green Building and Smart Building certifications by adhering to low-carbon, energy-saving, and sustainable principles.



### Company's Role in the Project

To implement and strengthen green building and smart building policies, the company employs the ten knowledge areas of the Project Management Institute (PMI) as methodology tools to manage each phase of the project, ensuring tasks are completed on time, within quality standards, and safely. Additionally, professional technical consultants and expert scholars are hired to provide consultation and guidance, incorporating diverse professional opinions as supervision, execution, and improvement strategies to demonstrate the effectiveness of promoting smart green buildings.

### Trial Operation and Inauguration Ceremony Information

The inauguration ceremony for the Kaohsiung High School 3D parking lot was held on February 6, 2024. Kaohsiung Mayor Chen Chi-mai stated that the parking lot, co-financed

by the central government's Forward-Looking Infrastructure Development Program and the city government, was built at a cost of 590 million NTD. The five-story facility accommodates 470 cars and 171 motorcycles. Under the supervision of the Kaohsiung City Transportation Bureau and the assistance of the project management and supervision firm Asian Engineering Consultants Corporation and the general contractor team Shangding Construction, the parking lot was completed two months ahead of schedule. This project effectively addresses the parking shortage caused by the light rail operation and relieves the parking issues in densely populated residential and commercial areas. Mayor Chen also thanked Legislator Li Kun-tze, Kaohsiung City Council Speaker Kang Yu-cheng, and councilors from Sanmin District for their joint efforts in securing funding for the parking lot, driving regional economic development, and resolving parking problems in Sanmin District.



Kaohsiung Mayor Chen Chi-Mai Attended Inauguration Ceremony

# PROFESSIONAL AWARDS / HONOR

## 2023 GEOTECHNICAL ENGINEERING TECHNOLOGY AWARDS

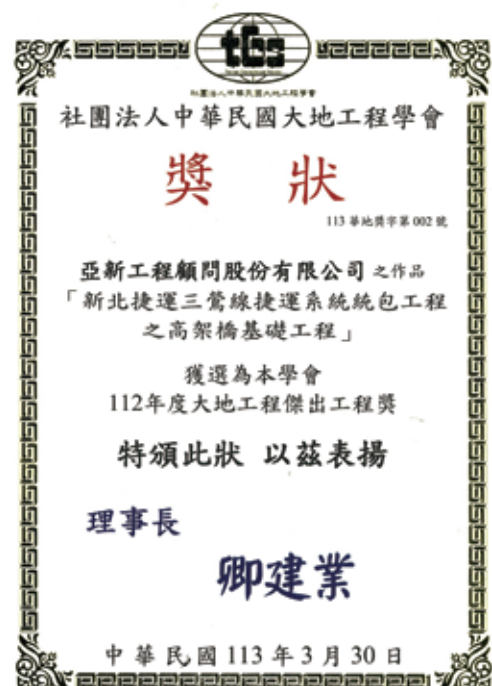
On 30<sup>th</sup> March, 2024, MAA was awarded the "2023 Geotechnical Engineering Technology Award" by the Taiwan Geotechnical Society. This award recognizes MAA's contributions to planning, design, construction, and management of the foundations of the elevated bridges on the New Taipei Metro Sanying Line.

The New Taipei Metro Sanying Line, a medium-capacity transit system, exemplifies modern engineering. Designed and constructed under a turnkey contract, the construction began in July 2016, and the foundation engineering for the elevated bridges has been successfully completed.

The project is a collaborative effort by a consortium that includes Hitachi Rail Signal System (Taiwan) Co., Ltd., RSEA Engineering Corporation, and Hitachi, Ltd. RSEA Engineering Corporation managed the civil engineering construction, while MAA served as the civil engineering detailed design consultant.

Spanning 14.29 kilometers, this turnkey project features 33 group pile foundations and 403 well-type foundations. These structures are strategically located along existing roadways, crossing rivers, National Highway No. 3, and the Taiwan Railways. The geotechnical engineering design incorporates a full project life cycle approach, ensuring the optimal foundation type and construction plan.

Utilizing the advantages of BIM, the project seamlessly integrated geotechnical and other engineering interfaces. This comprehensive life cycle record of the foundation engineering marks a significant milestone in the field of geotechnical engineering. MAA is honored to receive this recognition, which underscores the team's dedication to delivering high-quality and innovative engineering solutions.



2023 Geotechnical Engineering Technology Award recognizes MAA's Contributions on New Taipei Metro Sanying Line



# SEMINARS AND CONFERENCES

## THE 21<sup>ST</sup> SOUTHEAST ASIAN GEOTECHNICAL CONFERENCE AND 4<sup>TH</sup> ASSOCIATION OF GEOTECHNICAL SOCIETIES IN SOUTHEAST ASIA CONFERENCE



*Notable individuals who participated in the 21<sup>st</sup> SEAGC*

The 21<sup>st</sup> Southeast Asian Geotechnical Conference (SEAGC) and 4<sup>th</sup> Association of Geotechnical Societies in Southeast Asia (AGSSEA) Conference was held from 25<sup>th</sup> to 27<sup>th</sup> October 2023 at the Centara Grand & Bangkok Convention Centre, Central World, Bangkok Thailand. Organized by Thai Geotechnical Society and Southeast Asian Geotechnical Society under the auspices of Association of Geotechnical Societies in Southeast Asia (AGSSEA) and International Society for Soil Mechanics and Geotechnical Engineering (ISSMGE), more than 400 scholars, government officers, professionals, and students participated in this prestigious event of Geotechnical engineering community in Southeast Asia region.

Dr. Za-Chieh Moh, along with Dr. John Nelson and Dr. Edward Brand, founders and inaugural faculty members of the Geotechnical and Earth Resources Engineering (GTE) program at the Asian Institute of Technology (AIT), were invited to chair the keynote panel following the opening ceremony for a discussion on the theme 'Development of Geotechnical Engineering in Southeast Asia.' In the keynote discussion, the advances and prospects of geotechnical engineering in Southeast Asia were addressed briefly and

vividly. This included research, education, and project work that have continuously inspired people in this field from generation to generation since the founding of SEAGS.



Dr. Za-Chieh Moh, Prof. John Nelson, and Dr. Edward Brand (from left to right) in the Keynote Panel Discussion



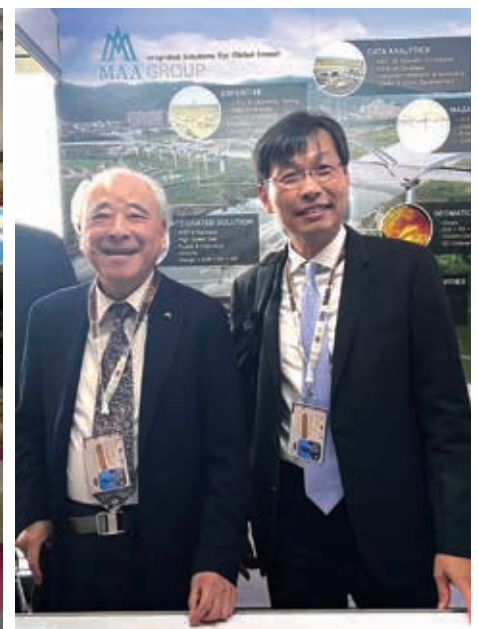
Dr. Jung-Feng Chang Gave a Speech

Many key figures in the field of geotechnical engineering participated in the conference. Twenty-seven exhibitors, featuring some of the most renowned construction companies and geotechnical specialty contractors from Thailand and the Southeast Asian region, participated in the exhibition. Four keynote lectures and 91 papers on special topics were presented in the conference and published in the conference proceedings. Among these, Dr. Jung-Feng Chang and Dr. Dofran Winner Luhulima, representing MAA, delivered their presentations, respectively titled 'Design and Feedback Analyses of Deep Excavation in Mixed Ground—A Case Study of Taipei MRT Projects' and 'Case Study of Settlement Analysis in Kaohsiung Railway Project.

The SEAGC-AGSSEA 2003 has provided a platform not only facilitated



MAA Booth in the Exhibition Area of 2023SEAGC



knowledge exchange but also strengthened collaborative ties across the geotechnical societies in Southeast Asia Region. Diverse and rich insights shared by the distinguished speakers, dedicated organizers, and engaged participants have made this conference a resounding success.



## 121<sup>ST</sup> REAAA GOVERNING COUNCIL MEETING & 25<sup>TH</sup> REAAA YEP MEETING

Road Engineering Association of Asia and Australasia (REAAA) is a professional organization committed to advancing the science and practice of road engineering and related fields.. REAAA was established in June 1973 with its current secretariat in Malaysia. REAAA emphasizes regional cooperation and technical alignment across its initiatives. With a membership of over 1,400 professionals from more than 24 countries, REAAA regularly organizes a variety of events, including triennial international conferences, technical visits and study tours, trade exhibitions, seminars, forums, and workshops. These gatherings foster knowledge exchange and promote best practices within the road engineering community.

The 121<sup>st</sup> REAAA Governing Council Meeting was held in Manila, Philippines, on 6<sup>th</sup> March 2024, alongside with 25<sup>th</sup> REAAA Young Engineers & Professionals (YEP) Meeting. Representing Taiwan at the meeting were MAA's Chairman Richard Moh, also CRF's Executive Director and Chair of International Affairs Committee, and Dr. Jaw-Chang Laiw, MAA's CTO and CRF's Senior Consultant of the International Affairs Committee.

Key decisions regarding the nomination for 18<sup>th</sup> REAAA Council Term made during the Council Meeting included:

- Approval of the nomination and election procedures for the new president; REAAA will subsequently form a nomination committee
- Dr. Marizwan from Malaysia announced that CRF's Executive Director and MAA's Chairman, Richard Moh, will be nominated as the new president for the term from October 2025 to October 2029. Member Countries, including Japan, Philippines, Australia, and Indonesia expressed their support, and the formal nomination will take place in the coming months.
- Continued monitoring of the nomination process.



121<sup>st</sup> REAAA Governing Council Meeting group photo

## 2024 FEIAP YOUTH TALENT INNOVATION COMPETITION (YTIC)

The 1<sup>st</sup> Youth Talent Innovation Competition (YTIC) took place on May 2<sup>nd</sup>, 2024, in Taipei, Taiwan, during the Federation of Engineering Institutions of Asia and Pacific (FEIAP) 32<sup>nd</sup> General Assembly Meeting and 7<sup>th</sup> Convention. It was one of the highlights of this year's FEIAP events.

YTIC serves as a global platform for young engineers to share and exchange innovative ideas through friendly competition, centered on the theme of Sustainable Development Goals (SDGs) to promote inventive and practical solutions aligned with global trends.

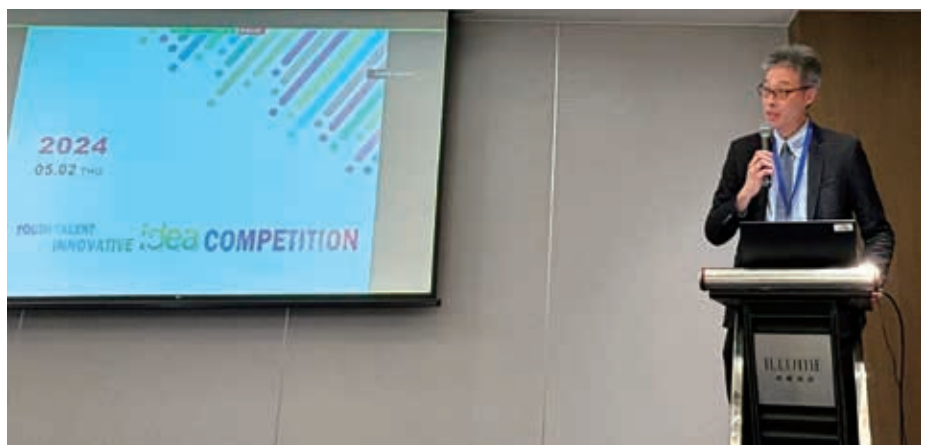
YTIC Objectives:

- To foster visions of next generation engineers through innovations and design thinking.
- To leverage on regional cooperation and a cross-border platform in providing opportunity for aspiring engineers.
- To step out of typical boundaries and provide opportunities for industry and engineers across different disciplines to collaborate on novel solutions.

YTIC, organized by the Chinese Institute of Engineers-Young Engineers Alliance Committee (CIE-YEAC), Chinese Institute of Engineers (CIE), and FEIAP Youth Talents Development Working Group (YTDWG), began detailed planning in late 2022. Under the guidance of Mr. Richard Moh, MAA's Chairman and council member of CIE, four young engineers from MAA were engaged in meticulous preparation over the course of 16 months.



FEIAP's President Dr. Aung Kyaw Myat gave a speech at the YTIC finals

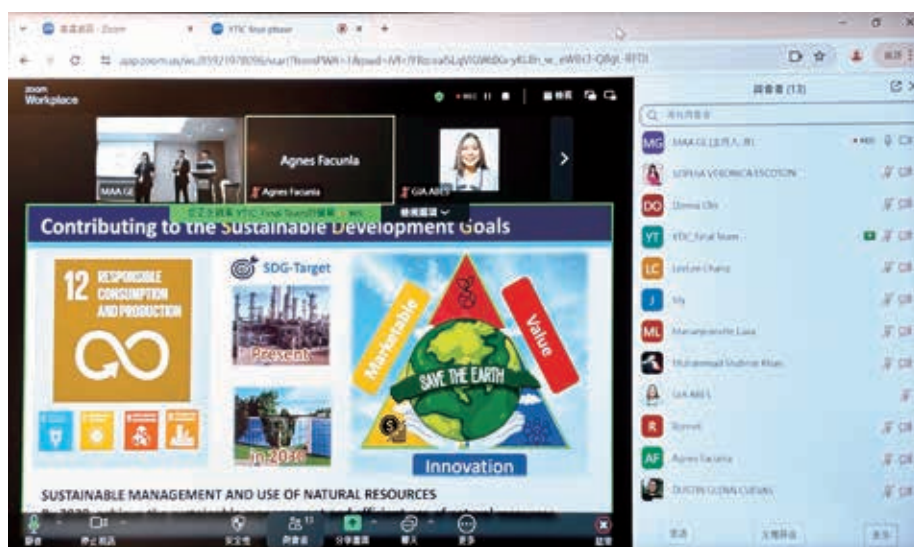


Opening Remarks by Chairman Richard Moh





Participants' creative proposal posters displays on-site



Finals live streaming



(From Left to Right) A distinguished panel of judges, including Prof. Dr. Aung Kyaw Myat, Ir. Dr. Heru Dewanto, Prof. Emeritus Dr. Douglas Hargreaves, Er. Chong Kee Sen, and Chairman Richard Moh, council member of CIE

Despite being in its inaugural edition, YTIC received an enthusiastic response, attracting entries from eight countries: Taiwan, Pakistan, Malaysia, the Philippines, Singapore, Cambodia, Indonesia, and Bangladesh. The participants included 22 student teams and 21 non-student teams. Out of 43 applications submitted during the registration phase, 25 advanced to the preliminary stage. After multiple rounds of online evaluation by domestic and international judges, three teams—two from Taiwan and one from the Philippines—were selected to advance to the final stage. The finals, featuring physical presentations, took place in Taiwan on May 2<sup>nd</sup>, 2024. A distinguished panel of judges, including Prof. Dr. Aung Kyaw Myat from Myanmar, President of FEIAP; Prof. Emeritus Dr. Douglas Hargreaves from Australia, Exco of FEIAP; Ir. Dr. Heru Dewanto from Indonesia, Exco of FEIAP; Er. Chong Kee Sen from Singapore, Chairman of Environmental Sustainability Standing Committee of FEIAP; and Mr. Richard Moh, council member of CIE, evaluated and ranked the teams on-site.



Key highlights of this year's finals included live online streaming to increase visibility and enable remote participation. Additionally, posters showcasing creative proposals from participating teams were prominently displayed, facilitating cross-border sharing of innovative ideas and fostering cross-cultural collaboration. On May 3<sup>rd</sup>, 2024, during the FEIAP Gala Dinner, the awards were presented, and acceptance speeches were delivered. The top three winners were: First place: MAGIC: Membrane-Assisted Green Irradiated Chemical Process (team members from Taiwan and Malaysia), Second place: Damsel Fly (team members from Taiwan and Indonesia), Third place: Eco-Thermo Builders (team members from the Philippines).

Special thanks were extended to the sponsors of this competition and the organizing units whose contributions ensured the success of the 2024 YTIC event.



*The Team Achieved 1<sup>st</sup> Prize in the YTIC Competition*



*The Team Achieved 2<sup>nd</sup> Prize in the YTIC Competition*



*The Team Achieved 3<sup>rd</sup> Prize in the YTIC Competition*





## FEIAP YOUNG ENGINEER EXCHANGE 2024



*Group photo at the entrance of MRT Sanying Line LB08 station*

The FEIAP Young Engineering Exchange (YeX 2024), organized by Young Engineers Alliance Committee of the Chinese Institute of Engineers (CIE-YEAC) in partnership with FEIAP's Youth Talent Development Working Group (FEIAP-YDTWG), unfolded in Taipei from May 1<sup>st</sup> to May 4<sup>th</sup>, 2024. In response to the 7<sup>th</sup> FEIAP General Assembly, which was also held in Taipei, Mr. Richard Moh, who served as both the host and chairman of YEAC and the deputy chairman of YTDWG, facilitated this event.

The “Malaysia-Taiwan Young Engineers Exchange” held in Taiwan in 2018 and the “International Young Engineer Exchange” in Hong Kong in 2019 were both successful, earning acclaim for fostering the exchange of experiences among young engineers from various international engineering societies. In this spirit, participants of YeX 2024 explored sites representing industry, government, and academia, engaged in discussions, exchanged ideas, and immersed themselves in the local ambiance over the course of 3 to 4 days during the event. Participants engaged in visits to prominent locations such as New Taipei City MRT Sanying Line, where innovative design principles integrating new infrastructure with indigenous communities were showcased. Attendees were pleasantly surprised by a free demonstration on shaping and dyeing glass by a local craftsman.



*A glass handicraft workshop nearby the station*



At National Science and Technology Center for Disaster Reduction (NCDR) attendees were welcomed by NCDR's Director Hung-Yu Chen and Chief Secretary Wei-Sen Li, who provided valuable insights into Taiwan's disaster preparedness, featuring tours of the Central Emergency Operation Center.

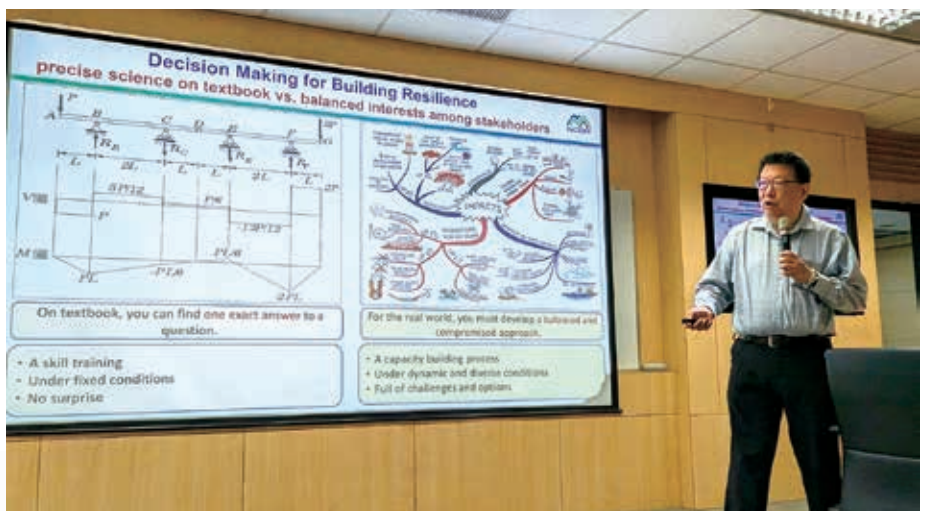
The program also included a dynamic roundtable discussion on the "Capacity and Mobility of Young Engineers", fostering dialogue among attendees.



Group Photo at the Lobby of NCDR



Left to right: YTDWG Chairman Ir. Yeoh Su Hong, NCDR Director Dr. Hung-Yu Chen, and MAA's Chairman Richard Moh



Group Photo at Central Emergency Operation Center



Group photo at Central Emergency Operation Center





Group Photo at Chinese Institute of Engineers



Engr. Dr. Aung Kyaw Myat, President of FELAP (left in the first row), Dr. Doug Hargreaves, Emeritus Professor of Queensland University of Technology (right in the first row), Dr. Heru Dewanto, President of Institution of Engineer Indonesia (left in the second row) Participating in the Young Engineers Networking.



YeX Attendees and the Judges Bonding over Food and Music at Super 346 Live House

Since 2019, the Chinese Institute of Engineers (CIE) has organized annual networking activities for young engineers. This year, CIE hosted the 5th networking event for domestic young engineers in conjunction with the YeX program at Super 346 Live House, fostering connections over local cuisine and live music. A total of 76 participants attended, including 35 international guests and 41 domestic engineers. Additionally, judges and candidates from the YTIC were invited. The exchange culminated in visits to the Center for Artificial Intelligence and Advanced Robotics, where Prof. Chuin-Shan Chen, Associate Fellow Wei-Tze Chang, and Research Associate Yi-Hsiang Chen presented concepts such as digital twins, augmentation of construction, and the ongoing Gen AI competition.

A professional development forum at NTU, jointly organized by the Civil Engineering Department of NTU, allowed delegates and students to share perspectives on regional development.





Prof. Chuin-Shan Chen, Director of AI Center, gave speech on AI



Dr. Yi-Hsiang Chen, Research Associate, gave speech on Augmentation of Construction



Dr. Wei-Tze Aries Chang, Associate Research Fellow, gave speech on Digital Twins



Group Photo with NTU Students at the Forum



Group Photo in front of the Main Gate of National Taiwan University



At the conclusion of YeX 2024, delegates from Taiwan, Indonesia, Malaysia, the Philippines, Singapore, and Myanmar gathered for the Gala Dinner. This event served as a grand finale, celebrating not only the achievements of the FEIAP 7<sup>th</sup> Convention but also the inaugural FEIAP Youth Talent Innovation Competition (YTIC). The evening provided a fitting backdrop for reflecting on the collaborative successes and innovative spirit fostered throughout the exchange, bringing together diverse perspectives and experiences in a vibrant atmosphere.



*Free Karaoke Time During the Dinner*



*Group Photo at the Venue of FEIAP Convention*





## CARBON NEUTRALITY REVOLUTION: INTEGRATING CIRCULAR ECONOMY AND BIM TECHNOLOGY FOR SUSTAINABLE PRACTICES SEMINAR

On 29<sup>th</sup> March, 2024, New Taipei Government, in collaboration with Taiwan Society for Circular Economy and MAA, jointly hosted the “Carbon Neutrality Revolution: Integrating Circular Economy and BIM Technology for Sustainable Practices Seminar.”

The seminar opened with keynote addresses from Ms. Hui Mei Chu, Director of New Taipei City Government Public Works Department, and Dr. Jaw-Chang Laiw, President of Taiwan Society for Circular Economy. They encouraged collective efforts to utilize innovative BIM technology in addressing challenges posed by climate change and creating a sustainable future. Mr. Richard Moh, MAA’s Chairman, also delivered an opening address for the seminar.

Notable speakers included Mr. Shih-Hsien Yang, Associate Professor of National Cheng Kung University; Mr. Yin-Wu Wang, Architect of Shang Hong Architects; Jing-Chi Jan, Assistant

Manager of Chien Kuo Construction Co., Ltd.; and Mr. Chung-Yun Li, Vice Director of New Taipei City Government Construction Office.

BIM technology is crucial for achieving carbon neutrality by improving the design, construction and management of buildings and infrastructure to reduce energy consumption and carbon emissions. The construction industry must integrate technology, circular economy principles, and green building practices to accelerate digital transformation and implement transparent, information-driven ESG sustainable development. This approach supports efficient and sustainable solutions to future challenges.



Opening Remarks by Chairman Richard Moh



# CORPORATE SOCIAL RESPONSIBILITY (CSR)

## CO-FOUNDER DR. ZA LEE MOH'S DONATION TO ESTABLISH AI APPLICATION AWARD FOR CIVIL AND HYDRAULIC ENGINEERING

On 25<sup>th</sup> September 2024, Dr. Za Lee Moh, Co-founder of Moh and Associates, Inc., received a letter of appreciation for his generous donation to the Chinese Institute of Civil and Hydraulic Engineering (CICHE) to establish the “AI Application Award”. The purpose of the award is to encourage significant achievements in the application of AI within civil and hydraulic engineering technology with a focus on innovative applications and educational promotion.

The AI Application Award honors outstanding individuals or teams whose research excellence in three key areas: best practices in AI application, innovative uses of AI technology, and educational achievements in promoting AI. The selection process is conducted by a committee of experts in AI and civil & hydraulic engineering. Funded by Dr. Za Lee Moh's generous contribution, the award seeks to foster innovation while ensuring effective administrative support.



MAA's Co-founder, Dr. Za-Lee Moh (front left, 3), and President of CICHE (MAA's Vice Chairman), Mr. Chung-Cheng Kao (front left, 2), with CICHE's Past Presidents and Secretary General









Integrated Solutions For Global Impact

MAA GROUP

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