



11月18日下午

# 2016土水國際論壇 台灣之光 國際舞台競技



呂理事長致歡迎辭



韓國 KSCE 理事長 Prof. Sung Woo LEE 擔任貴賓致詞



論壇由王華弘副主委主持第一場

## Welcome Messages

On behalf of the Chinese Institute of Civil and Hydraulic Engineering, CICHE, I would like to express our sincere welcome to all of you who attend the 2016 International Forum. Special thanks to speakers from Korea, Japan and Hong Kong for sharing and enlightening us with their remarkable experiences. Presentations from several local fellow engineers also complement the agenda significantly.

We chose the main theme “Expanding the Engineering Horizon” for the program for several reasons. From a historical perspective, changes in human civilization have greatly affected the way in which engineers work Engineering problems that we are solving have changed in nature and in scale. In the past, a typical project involved engineers from two or three disciplines within the same organization and speaking the same language; together, they engaged in solving a well-defined problem. Nowadays, however, engineering projects in most countries require engineers with different technical and even non-technical educational backgrounds, from multiple companies or organizations, perhaps in several countries with different languages; that is, an international, intercultural, and interdisciplinary team collaborate on solving a complex problem. Today’s Forum will showcase some projects along this line. The Hyundai Engineering & Construction Co., Ltd., Korea under the leadership of Director Eu Kyeong Cho, will demonstrate their work in the Third Bosphorus Bridge Project. The Ove Arup & Partners Hong Kong team, managed by the East Asia Rail Director, Timothy Suen, will present the Bangkok MRTA Blue Line Extension Design & Build Contract. Supervising Project Manager of Kajima Corporation, Japan, Ishizuka Ichiro will share his point of view as he works in Taiwan on one of the Kaohsiung Mass Rapid Transit Projects. Project leaders from CECI Engineering

Consultants, Inc. and CTCI Corporation will contribute their oversea and international collaboration experiences.

CICHE is the largest non-government, nonprofit civil and hydraulic engineering organization in Taiwan. It not only carries on the legacy of the nation’s founding engineers since 1936, but also takes the leadership in cultivating engineers for the future to come. We believe that only by engaging ourselves in the business of training of future engineers, we could inspire more able engineers and thus gatekeeping the welfare of the society we serve. To that end, we are to end the Forum by sharing our vision and knowledge on Accreditation of Engineering Programs and International Recognition of Future Engineers. In addition to my professorship and presidency at the CICHE, I am also the Deputy CEO of IEET, the accreditation agency for engineering and technology programs in Taiwan. It is worth noting that for the past two years, CICHE and IEET, together with the Chinese Association of Engineering Consultants, have co-sponsored the annual engineering innovation competition with the purpose to engage college students in real and serious civil engineering design experience. Student teams with the top three prizes this year will be awarded and celebrated at the Annual Meeting tomorrow.

Among one of the top priorities addressed in the CICHE White Paper two years ago is embracing a collaborative effort to make the earth a better place. That is why your presence to this Forum means so much to us. Once again, thank you very much and I wish the Forum a great success!

Liang-Jenq Leu, Ph.D.  
President, Chinese Institute of Civil and Hydraulic Engineering (CICHE)  
November 18, 2016

## Overseas Consultant Services for Mass Rapid Transit Engineering Projects



**Hung-I CHAN**

Deputy Project Manager, CECI Engineering Consultants, Inc., TAIWAN

### Expertise

Construction Planning and Civil Engineering Design Mass Rapid Transit Project Design Management Bridge Construction Supervision

### Abstract

CECI was established in 1969 for developing the infrastructure of Taiwan. CECI has provided its first overseas consultant service for highway project in Indonesia since 1974. Now, CECI has expanded its overseas services to different disciplines such as Railway, Mass Transit Systems, Airports, Harbors and Land Development. The locations of projects have been expanded from Asia to Africa and Central America.

This report aims to share the experience gained from overseas consultant services for Mass Rapid Transit (Hereafter MRT) projects delivered in south east Asia. Firstly, an overview of MRT market in southeast Asia region is presented. Secondly, a SWOP (Strength-Weakness-Opportunity-Potential) analysis of resources based on real overseas projects were reviewed and examined carefully. Major difficulties and problems encountered were identified and studied. Thirdly, various improvement measures have been proposed and implemented focusing on how to provide customized services for the clients from various countries and regions. Major improvement measures include: provide centralized and real-time home support, create resilient IT systems to enhance efficiency and safety, establish design capacity for major international/regional/national codes, utilize 3D design flow and develop in-house API to meet variety requirements of the Clients around the world.

Through nonstop improvement and innovation, CECI were able to deliver value-added services and retain competitive advantage to other international consultant firms. Positive feedbacks from our clients have assisted CECI successfully get into MRT market of Indonesia, Malaysia and other south east Asia countries. Most important, there are more and more engineers who are confident to devote their time and efforts in overseas projects. They are proud to shine for Taiwan.

We sincerely hope that the challenging journey CECI went through can be a great asset for any engineering parties who would like to contribute their expertise abroad. The journey might not be smooth, but as long as you press forward, anything is possible.



## Bangkok MRTA Blue Line Extension Design & Build Contract 1 Package



**Timothy SUEN**

Arup Fellow, Director, East Asia Rail Leader  
Ove Arup & Partners Hong Kong Ltd.,  
HONG KONG

### Expertise

Timothy has hands-on experience in working with government bodies, investors, operators, contractors and consultants. He is highly conversant with the rail industry practice in the East Asia region and plays a major role in the development of railway infrastructure in the region.

Timothy is Arup's East Asia Champion for the promotion and delivery of railway projects together with topside property development (R+P) in Hong Kong and the Mainland.

### Abstract

As part of the 570km rail transportation infrastructure development plans for Bangkok, Thailand, the current MRTA Blue Line Extension project, which has a total length of 27km with 19 stations, will be a significant move towards an orbital rail network to alleviate the city's chronic and severe traffic congestion. The Blue Line Extension project is divided into 6 different contracts. Arup have been commissioned to provide multi-disciplinary design services to Contract 1 for Italian-Thai Development Public Company Limited (ITD).

Contract 1, with a project value of US\$350 million, comprises the design and construction of the underground civil works between the existing Hua Lamphong Station and the new Sanam Chai Station of Contract 2 (approximately 2.8km in length). This Design-and-Build project involves an extension of the south end of the existing Blue Line, which has been in operation since 2004. This comprises 6.4m-diameter twin running tunnels, a 17m-deep cut-and-cover tunnel, two 40m-deep intervention shafts and two underground stations with stack platforms, all of which are being built by the Top-Down Construction Method.

One of the two stations is the deepest underground structure ever constructed in Bangkok with an approximate depth of 32m





below ground where ground water control is a major challenge associated with excavation base stability. Also, horizontal pipe piles had been used to allow part of the station excavation beneath an archaeological site, which is novel in Bangkok. The two running tunnels were constructed with a single EPB TBM, which was launched from the cut & cover tunnel section through the stations and retrieved at the end of another station, constructed by others, adjacent to the contract boundary.

Arup provides “total design service” including Architecture, Alignment, Civil, Structural, Geotechnical, Tunnelling, Building Services, Fire and Tunnel Ventilation as well as full interface design co-ordination with the E&M Systemwide & rolling stock design.

This civil works contract is targeted for completion in the first Quarter of 2017.

## CR4 Section, Construction of Formosa Boulevard Station, Kaohsiung Mass Rapid Transit Project



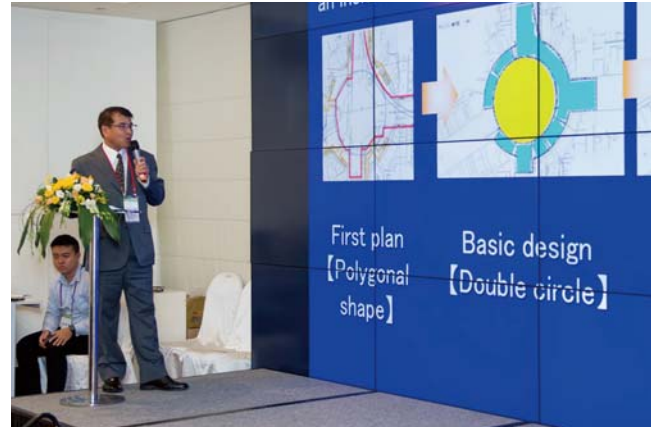
**Ichiro ISHIZUKA**  
Supervising Project Manager  
Construction Department, International Division  
Kajima Corporation, JAPAN

### Expertise

Executive Professional Civil Engineer [Construction and Project Management]  
Project Management Professional

### Abstract

In Taiwan’s second-largest city of Kaohsiung, the city’s first ever subway lines to serve the area – the north-south Red Line and east-west Orange Line – have been constructed and in operation. For CR4 section, the construction of Formosa Boulevard Station, the point where the two lines will intersect, Circular Continuous Underground Wall Construction method with an inside diameter of 140 meters was adopted, and successfully completed in September 2008. The speech will introduce the design and construction management of CR4 project, and the dispute with the Client.



## Innovation, Sustainability and International Collaboration



**Ming Gen LEE**  
Vice President  
CTCI Corporation, TAIWAN

### Expertise

Engineering, procurement, construction and management of refinery and petrochemical project

### Abstract

CTCI Corporation is a global engineering services provider that offers a comprehensive range of services, products, and solutions.

CTCI has strived to deliver the world’s most reliable engineering, procurement, fabrication, construction, commissioning and project management services.

CTCI serves the hydrocarbon, power, environmental, transportation and industrial markets. The company is Taiwan’s leading EPC services provider, with 7,500 employees in more than a dozen local offices worldwide.



## Third Bosphorus Bridge



**Eu Kyeong CHO**

Director  
Hyundai Engineering & Construction Co.,  
Ltd., KOREA

### Specialized Qualification

Class 1 Engineer - Civil Engineering  
Professional Engineer - Civil Construction Engineering  
Member of International Association for Bridge and Structural Engineering

### Abstract

The Third Bosphorus Bridge (Called Yavuz Satal Selim Bridge) is located at the most northerly extreme of the Bosphorus Straits in Turkey with the intention that it will allow the heavy traffic to bypass the congested roads of Istanbul's main conurbation.

The bridge combines two different transport solutions – rail and road – within the same corridor and the same level, supported on a 58.5m wide steel deck. It will be the widest suspended bridge deck in the world. The main span is 1,408m in length with two concrete towers 322m in height, accommodating a two-carriageway motorway with four lanes in each direction, separated by a twin-track railway system in the center. It will be the longest combined road and railway bridge in the world.

The Third Bosphorus Bridge is a suspension bridge combined with stay cable (stiffening cable) like the Brooklyn Bridge, called Highly Rigid Suspension Bridge. By adopting the suspension system in the middle of the main span and the stay system in the sections near the towers, this bridge combines advantages of a suspension bridge for longer span capability and of a cable-stayed bridge which exhibits greater rigidity which is beneficial for railway traffic. The deck is divided into three zones depending on the type of support: stay cables in the stiffening zone, stays and hangers from the main cables in the transition zone and finally only hangers in the suspended zone.

Hyundai E & C participated in this project as EPC contractor and the Third Bosphorus Bridge was opened on August 26, 2016 after going through the construction period of 38 months.



## Accreditation of Engineering Programs and International Recognition of Future Engineers



**Liang-Jenq LEU**

Professor, Dept. of Civil Engineering, National Taiwan University  
President, Chinese Institute of Civil and Hydraulic Engineering  
President, Chinese Society of Structural Engineering

Standing Board Member, Chinese Taiwan Society for Earthquake Engineering

Deputy Secretary General and Deputy CEO of Accreditation Council, IEET

### Expertise

Prof. Leu is an expert in nonlinear analysis and design of structures, computational mechanics, and structural optimization. In addition to his research, Prof. Leu had led and spearheaded in curriculum redesign in his tenure as the Department Chairman (2010/2-2016/7) aiming at enhancing students' hands-on ability. The contribution of the curriculum redesign has resulted in a series of engineering design courses, namely the required course in the first semester for Freshmen "Conceptual Design Studio" and the required course in the second semester for Freshmen "Physical Model Design Laboratory" (AKA the Cornerstone); required course in the second semester for Sophomore Students "Structural Theory and Fluid Mechanics Laboratory" (AKA the Keystone); and now a required course in "Civil Engineering Capstone Challenge" for Junior or Senior Students (AKA the Capstone). The combination of the courses is later dubbed "Hands-on Course Trilogy."

As the President of CICHE (2013/11 to now), Prof. Leu has paid significant effort to elevate service of the Institute for its members, the profession, and the society at large in addition to promoting the health of the Institute's human resources and finance. Most importantly, he has played an effective leadership role to raise the visibility and welfare of the Civil Engineering as a Profession through public engagement such as drafting the Civil Engineering Basic Act, the White Paper of the Civil Engineering Industry, etc. Prof. Leu has been on the faculty of Civil Engineering at National Taiwan University for over 22 years and has trained over 70 master's degree and PhD students.

### Abstract

Over the last 30 years, seven international agreements under the umbrella of International Engineering Alliance (IEA) have been set up to govern mutual recognition of engineering qualifications and professional competence. With respect to higher education qualification in engineering, the agreements are the Washington Accord, the Sydney Accord, and the Dublin Accord. Each of these accords apply a set of graduate attributes in deciding the substantial equivalence among accreditation system of its signatories or potential signatories.

Institute of Engineering Education Taiwan (IEET) is a signatory of the Washington Accord and the Sydney Accord under the IEA. It is also a signatory and Secretariat of the Seoul Accord,



agreement covers mutual recognition in respect of tertiary-level qualifications in computing and IT-related disciplines. Meanwhile, it is recently advanced to the provisional status of the Canberra Accord, agreement governing mutual recognition of architectural education degrees. Since its establishment, IEET has deep commitment and has engaged itself in numerous international outreach projects in addition to its obligation of serving as peer panel for the reviews within the Accords. In recent years, IEET has been working with Myanmar Engineering Council to set up accreditation system in Myanmar. The project is ongoing and over the past four years, IEET has seen dramatic change in attitudes and planning of the higher educational sector in Myanmar. Since 2015, IEET has also been invited to conduct accreditation in universities and colleges within China, namely the provinces of Fujian and Guangdong with the purpose of uplifting quality of education. All the endeavors in China, however, do not suggest any international recognition of degrees, but the quality assurance of education.

Throughout its twelve years of accreditation operation, IEET is proud to have enacted a number of initiatives to renew Taiwan's engineering education, and the first and the foremost is the promotion of the alignment of outcomes-based education, assessment, and accreditation. And the second one is the requirement of capstone course. This presentation is to report IEET's work in the above areas and hopefully to invigorate more thoughtful discourses on the topic of training of future engineers among engineers, academics, and the society at large.

### 國際論壇紀實 王華弘、謝啟萬

依循前一年的成功經驗，2016年中國土木水利工程學會年會在105年11月19日星期六舉行的前一天，安排一個下午時段的國際圓桌論壇。今年大會主辦單位配合以年會「邁向大未來－跨界、跨域、跨時代」的主題，在國際圓桌論壇的子題規劃上，則以「擴大工程的視野」(Expanding the Engineering Horizon)為核心，邀請來自香港、日本及韓國的工程專家出席發表演說，同時也搭配臺灣成功進軍國際的中鼎工程及臺灣世曦代表，分享工程專業跨境技術服務的實際經驗，論壇演講人在分享執行海外專案的同時，也觸及工程師跨領域服務所面臨的許多挑戰。圓桌論壇主題由於呼應政府「新南向」政策，也有鑑於台灣工程產業國際化發展面臨人才培育的需要，所以圓桌會議的總結，特別請到本學會呂良正理事長，以國際認可新一代工程師所需具備的養成教育認證制度做結尾，整個圓桌論壇分成兩個場次，由6位專家各發表30分鐘的專題演講，並於演講過後由在場來賓提問。由於歷年圓桌論壇建立良好的口碑，加上今年擔綱主講者均為學養兼備的高級工程專業管理層級，演講主題極



具特色，吸引全場近百位來賓參加。全場互動氣氛熱絡，結束後所有出席參加的聽眾，無不感受演講內容精彩詳實獲益良多。

圓桌論壇從上午工程參訪結束，中午用餐稍事休息過後，參加者陸續於下午一點20至50分完成報到入場。國際圓桌論壇的第一階段，首先準時在一點50分開始，經場次主持人王華弘副主委宣布開始，並邀請呂理事長向全體致歡迎詞。呂理事長除了向全體國內外貴賓致意，說明設計圓桌論壇的背景，感謝每一位出席圓桌論壇發表專題的講員。最重要的是向全體來賓介紹學會的發展，並揭櫫兩年前所制訂的白皮書，而圓桌論壇所涉獵的國際跨境技術服務輸出，正是體現白皮書的具體內容。理事長同時也以中華工程教育學會的領袖身分，強調近年來臺灣工程教育認證之成果，也是未來工程產業扎根人才培育的基礎。隨後，由於韓國土木工程師學會理事長 Sung Woo Lee 需要在國際圓桌論壇結束前前往機場，因此特別穿插邀請前韓國國民大學 (Kookmin University) 上台向全體致詞。李理事長除了特別感謝大會安排之外，並且強調韓國土木工程師學會與臺灣之間長期保持熱烈互動，言詞間除展現韓國近幾年在國際營建工程龐大的貢獻，並且重申感謝歷年在韓國土木工程師學會年會舉行時，本學會均派員參與盛會。



第一場次的第一位主講人，是由目前國內工程顧問業規模最大的臺灣世曦工程顧問股份有限公司捷運工程部詹宏義副理，以世曦過去在海外參與各國捷運工程規劃設計的經驗，提出專題演講。內容除了簡單介紹世曦的海外成就，特別聚焦在過去印尼雅加達捷運工程所經歷的各項歷程。30分鐘演講除了提出執行海外工程所面臨的當地語言、文化和規範的適應，也介紹世曦在各項規劃背後所具創意的用心。第二位主講人則由來自香港知名的奧雅那(Ove Arup & Partners)工程顧問公司資深專案經理 Timothy Suen，為在場的來賓介紹該公司參與泰國曼谷捷運藍線河底延伸段第一期隧道統包工程，除了整體計畫規模大、時程短、品質要求嚴格造成規劃設計難度高。在這項分為六個區段標案的複雜工程裡，充分展現了該公司細膩的工法和卓越的成就。第三位主講人的身分則與前兩位不同，來自日本鹿島(Kajima Corporation)的資深專案經理 Ishizuka Ichiro，不但在過去2008年親自來臺參與高雄捷運工程，圓桌論壇主講30分鐘的內容，特別介紹高雄捷運CR4標美麗島站的開挖施工。這項曾奪得國內各項大獎的站體，由於地處都會地區交通樞紐，且在主管機關要求施工期間須保持交通的暢通，因此使用內徑達140米的圓形地下牆，分段處理高雄軟弱砂質地層的區段開挖，順利於2008年9月完成。日籍專家不但專業負責，更在過去曾派駐世界各地歷練，透過圓桌論壇發表的機會，也表達過去在高雄服務的心得。第一場次三位專家，同樣都是以工程技術身分投身於海外專案，演講主題均以都會地區捷運工程為主，現場來賓除了從三位專家演講內容獲得專業技術的知能，更重要的是從他們身上展現出工程師不畏艱難的勇氣和特質。第一場次很順利地於下午3點40分結束，雖然因為現場問答互動有所耽延，但是整場座無虛席反應熱烈。



張陸滿主委和老朋友打招呼

緊接著在經過近30分鐘的中場休息之後，第二場次的國際圓桌論壇於下午四點開始，第二場次由本學會國際關係主任委員謝啟萬教授開場。第一位上台的是中鼎工程李明進副總經理，以台灣科技大學管理碩士及7,500名員工的集團內任職多年的豐富的學經歷，李副總在中鼎集團內負責東協國家及香港、澳門區域的主管，專責集團在該區域之發展及關係企業之經營管理，直接向中鼎工程股份有限公司集團副董事長報告。李副總以近幾年來中鼎講求的創新、永續發展為集團下一階段與國際合作的基礎。演講中除了介紹中鼎集團目前的國際工程專案執行狀況，更對於未來集團發展的願景及策略，提供與會來賓深入的介紹。第二位發表演說的是目前在韓國現代集團下，擔任工程及營建部門的主管 Eu Kyeong Cho 博士，以該集團所投入的博斯普魯斯第三號跨海大橋為題發表30分鐘的演說。位於土耳其伊斯坦堡的交通要衝，這條兼具鐵路及公路的大橋橋面，寬為58.5公尺的鋼結構所組成，完成之後長達1,408公尺的主跨，自今年8月26日完工之後，已創造是世界上最長公路鐵路吊橋最長橋梁的紀錄。



論壇現場大家聽得津津有味





最後一位演講者為本學會呂良正理事長，以未來工程師國際認可所需要的基本工程教育認證標準為題，除了開場介紹當前世界工程師組織的發展，從工程師養成教育的各項國際協約，談及目前中華工程教育學會已成為國際組織的成員。目前持續在國際上不斷貢獻，從協助緬甸及中國大陸，台灣目前工程教育的成就已經受到舉世的矚目與讚揚。最後，呂理事長也介紹過去 12 年來

不斷地在工程教育的演進中，推展頂石課程成效卓越，不但是在台灣大學，許多目前成功推展頂石課程的學校科系，所培育出來的人才都符合新世代產業的需求，具備整合與團隊實務的軟能力。整個第二場國際圓桌論壇，就在主持人掌握時間和聽眾演講者頻繁的互動中，比起規劃在 5:35 分結束略晚，結束前全體演講者與主持人在前台合影留念。



2016 土水國際論壇圓滿成功

### 國際晚宴持續熱絡互動



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兩位青年才俊



中韓合作



難得的跨國交流



歐善惠常務理事



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壽克堅主任（左）與 Prof. Yueng 夫婦（中）



麗明營造陳國龍經理（中）



許泰文理事以酒致意



理事長的兩個好幫手



康仕仲教授特別趕來參加晚宴



感謝柯武德教授（左）促成日本精彩演講



感謝 Arup Group 羅光育經理（左）