

SEMINAR ON Engineering Challenges of Pile Foundations on Limestone

SPEAKERS:

FORUM MODERATOR:



Ir. MAK WAI KIN



MR. DEVENDRAN
ARUMUGAM



Ir. CHOW CHEE MENG



Mr. THE CHENG ENG



Ir. TAN CHIN SHU



Ir. RUSNIDA TALIB



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25 FEBRUARY 2025, TUESDAY
8:30 AM - 6:00 PM
ARMADA HOTEL, PETALING JAYA

Registration fee (Subject to 8% SST)

BEM Approved CPD: 7
Ref. No.: IEM25/HQ/008/S

GRADE

**FEE
(VIA IEM
WEBSITE)**

**FEE
(THROUGH
EMAIL)**

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RM230

RM250

**IEM Member / HRDC for
IEM Member**

RM350 / NA

RM400 / RM425

**Non-IEM Member / HRDC
for Non-IEM Member**

RM750 / NA

RM800 / RM850

APPROVED DURATION:
05/01/2025 - 05/01/2026
HRD CORP SERIAL NO:
10001505244



SYNOPSIS

Limestone poses unique challenges in foundation engineering, from cavity detection to the complexities of foundation design and construction. This seminar brings together leading experts to address these critical issues, sharing insights from planning, design and construction of foundation on limestone.

Through an interactive panel discussion, participants will have chance to gain valuable insights to better tackle the challenges associated with foundations in limestone areas. This event is essential for those seeking solutions to tackle the unique challenges of limestone foundations.

PROGRAMME

Time	Description	Speaker
8:30am – 8:50am	Registration & Light Refreshment	
8:50am – 9:00am	Welcoming Address	
9:00am – 10:00am	Session 1: Site Investigations in Limestone Formation for Pile Foundation Design	Ir. Mak Wai Kin
10:00am – 10:30am	Morning Tea Break	
10:30am – 11:30am	Session 2: Common Challenges in Cavity Detection	Mr. Devendran Arumugam
11:30am – 12:30pm	Session 3: Common Challenges in Design & Construction of Injection Piles on Limestone	Ir. Chow Chee Meng
12:30pm – 2:00pm	Lunch	
2:00pm – 3:00pm	Session 4: Common Challenges in Design & Construction of Bored Piles on Limestone	Mr. The Cheng Eng
3:00pm – 4:00pm	Session 5: Common Challenges in Design & Construction of Micropiles and other Foundations on Limestone	Ir. Tan Chin Shu
4:00pm – 4:15pm	Afternoon Tea Break	
4:15pm – 6:00pm	Session 4: Forum & Panel Discussion - Challenges of Pile Foundation on Limestone Forum Moderator: Ir. Rusnida Talib Panel: All Speakers	
6:00pm	Closure	

REGISTRATION FORM

No	Name (s)	M'Ship Number	IC No.	Fee (RM)
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ADD SST @8%				
TOTAL PAYABLE				

***Fees MUST be fully paid BEFORE the CLOSING DATE. Seats could only be confirmed upon payment. Enclosed herewith a crossed cheque No: _____ for the sum of RM _____ issued in favour of "The Institution of Engineers, Malaysia" and crossed 'A/C payee only'. I/We understand that the fee is not refundable if I/We withdraw after my/our application is accepted by the Organising Committee as stated in the cancellation term. If I/We fail to attend the seminar, the paid registration fee will not be refunded.**

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CANCELLATION POLICY

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SPEAKERS' BIODATA

Title: Site Investigations in Limestone Formation for Pile Foundation Design

Ir. Mak Wai Kin



Synopsis:

This session focuses on planning and conducting site investigations in limestone formations. A good understanding and strategy are needed to address the unique challenges of this geological setting. Participants will learn to select suitable investigation methods through fieldwork and laboratory testing. These methods help to develop subsoil profiles and determine key parameters for foundation design.

The session will also include case studies with real examples of investigation scopes and challenges. These examples aim to present practical strategies and lessons learned for dealing with common issues.

Speaker's Profile:

Ir. Mak Wai Kin has over 22 years of experience in engineering design, analysis and project management for buildings and major infrastructure projects. His expertise includes deep foundations, excavation, soft ground treatment, slope stabilization, underground works, tunneling and retaining systems.

He is the Managing Director of Solstruct Engineers Sdn Bhd, a company he founded in 2017. Ir Mak holds both Bachelor's and Master's degrees in Civil Engineering from Universiti Teknologi Malaysia. He is an active member of professional bodies such as IEM and ACEM. Currently, he serves as Deputy Chairman of IEM's Geotechnical Engineering Technical Division. He has been appointed as ICE for several Design and Build projects managed by JKR across Malaysia. Ir Mak is also a registered Geotechnical Engineer and Independent Checker Engineer (ICE) in Penang.

He played a pivotal role as the local lead in the geotechnical design for the tunneling and underground construction of Kuala Lumpur's MRT Kajang Line and later the detailed design for six underground stations on the MRT Putrajaya Line. His portfolio also includes iconic projects such as the Widening of Penang First Bridge, Penang Second Bridge, Electrified Double Track Projects, North-South Expressway Widening, Pan Borneo Highway Sabah and Sarawak Coastal Road.

Title: Common Challenges in Cavity Detection

Synopsis:

Karst formation is the result of dissolution of carbonate rocks such as Limestone and Dolomite. Limestone found in Malaysia is largely extreme karst V, whereby much of the carbonate rocks have undergone dissolution and weathering. Dissolution of the limestone results in many features such as large and small caves, pinnacles, troughs, solution channels, steep sided rock, undercuts, dolines, jiggered bedrock, sinkholes and depressions. There are many engineering projects that call for identification of these features to design foundations, earth retaining systems, deep excavations, tunneling projects and pile detection. The solution channels and cavities when exposed during construction can become sinks for groundwater flow and thus possibly cause depressions and sinkholes. Kuala Lumpur geology is complex underlain by granite, Kenny hill, limestone (marble) and quartz. The complex geology and its associated geological features make cavity detection a challenge. Often geophysics is the major method of cavity detection. The techniques used include seismic refraction, MASW, gravity method, GPR, seismic cross hole tomography and electrical resistivity. Coupled with borehole investigation, rock probing and drone mapping cavity detection can have a high success rate. In this presentation examples from SMART tunnel, MRT KJ & PJ lines will be discussed to illustrate the challenges and the lessons learnt.

Speaker's Profile:

Mr. Devendran Arumugam works as Site Investigation Manager with Gamuda Engineering. He is currently working on Mutiara LRT and Penang Sea Reclamation projects. He graduated from Universiti Sains Malaysia with a degree in Physics majoring in Geophysics. His vast experience of almost 40 years focusses on the geophysical applications in geotechnical engineering, tunnelling, groundwater exploration, offshore sand exploration, onshore and offshore soil investigations. He is a professional geologist registered with the board of geologist, Fellow of Institute Geology Malaysia, Member of Scale of Fees Committee Board of Geologist. He serves on the panel of industry experts at Universiti Teknologi Petronas and Universiti Sains Malaysia. His interest includes educating non geophysicists in the applications of geophysics and developing innovative methods in presenting geophysical findings.

Mr. Devendran Arumugam



SPEAKERS' BIODATA

Title: Common Challenges in Design & Construction of Injection Piles on Limestone

Ir. Chow Chee Meng



Synopsis:

Large diameter injection piles (or more commonly known as jack-in pile in Malaysia) has been successfully adopted in Malaysia since late 1990s and currently, large diameter spun piles of up to 600mm in diameter with working load as high as 3200kN have been successfully adopted for high-rise buildings up to 45-storeys. This presentation summarises some experiences and challenges in design and construction of high capacity jack-in pile systems in limestone formation especially for ground with shallow limestone bedrock. Some comparison will also be made between the performance of the piles in granite formation and limestone formation in order to illustrate the challenges associated with injection piles on limestone.

Speaker's Profile:

Ir. Chow Chee Meng obtained his Bachelor of Engineering (Civil) from University of Malaya and started his career with G&P Geotechnics, an independent consulting company specialising in Geotechnical and Geo-Environmental Engineering before joining Technip, the largest integrated offshore and onshore engineering contractor in South East Asia for the design and construction of hydrocarbon field development, oil refining, gas processing, petrochemicals and industrial plants and facilities.

He has written numerous papers and given lectures on engineering subjects ranging from R&D to geotechnical engineering in international and local conferences and journals and his research interests includes deep excavation, jack-in pile, piled raft and soil nails.

Throughout his career as a geotechnical engineer, he was fortunate to be involved in a number of award-winning projects such as Bandar Botanic, Klang (ACEM Silver Award of Merit), Sg. Damansara Flood Mitigation (ACEM Gold Award of Special Merit) and was awarded the Outstanding Performance Award from Sunrise Berhad for geotechnical consultancy.

He is currently the Director of G&P Geotechnics after re-joining them in 2005 and is actively involved in various types of projects such as high-rise development, major infrastructures such as MRT/LRT/BRT/HSR and major petrochemical plants.

He is a committee member of the Geotechnical Engineering Technical Division of the Institution of Engineers, Malaysia (IEM) from 2008 to 2013. He is currently serving the Board of Engineers, Malaysia (BEM) as Investigating Committee Member on Professional Practice (since 2014), Member of the Industry Advisory Panel (IAP) for the Faculty of Engineering and the Built Environment, SEGi University (since 2016), Member of the Industry Advisory Board (IAB) for Bachelor of Civil Engineering with Honours Programme, UCSI University (since 2021), Committee Member of Malaysian Geotechnical Society (since 2021) and Editorial Reviewer of the Geotechnical Engineering Journal of the SEAGS & AGSSEA (since October 2021).

Title: Common Challenges in Design & Construction of Bored Piles on Limestone

Mr. The Cheng Eng

Synopsis:

This lecture addresses the challenges in designing and constructing bored piles in limestone areas of Kuala Lumpur, drawing directly from extensive experience of Econpile, a piling specialist contractor. It features first-hand case studies highlighting real-world examples, providing insights into the practical difficulties faced on-site, such as navigating complex geotechnical conditions, maintaining borehole stability in karstic formations, and ensuring quality control during construction. Through these case studies, the lecture will also highlight the innovative solutions and best practices the company has applied to overcome the challenges, providing actionable lessons for industry professionals.

Speaker's Profile:

Mr. The Cheng Eng is the founder and the Group Managing Director of Econpile Holdings Berhad, listed on Bursa Malaysia. With over 50 years of personal hands-on experience in the piling industry, Mr. The has been instrumental in shaping the company's success.

With a track record spanning more than 35 years, Econpile has established itself as a reputable deep foundation contractor, adept at addressing complex ground conditions and challenging site constraints. Notably, the company has successfully completed numerous high-profile basement projects in the geologically demanding limestone terrains of Kuala Lumpur.



SPEAKERS' BIODATA

Title: Common Challenges in Design & Construction of Micropiles and other Foundations on Limestone

Ir. Tan Chin Shu

Synopsis:

Limestone formation often is a nightmare for the Developer, as the cost of foundation can dig deep into his pocket. As for the Consultant is a big challenge as he has strike a balance between a technically sound solution and the ever pressing need to work within the Client's budget. As for the Contractor limestone could be a "gold mine" or "Land mine" all depending on the Terms and Conditions of the Contract details.

While micropile is often accepted as the solution for foundation in Limestone formation, there still exists many challenges. Here are some of them;

- It's a Rolls-Royce Solution i.e. being one of the most expensive piling systems. One adopts it only when other solutions are not viable.
- The Karstic features of limestone such as cavities, steep inclined face, overhang, floaters, deep sharp drop within a small space etc. pose very challenging demand from all parties involved.
- Various solutions and methodology of drilling will be discussed to address the above problems.
- Some case studies encountered will be presented.
- Projects in difficult and complex limestone formation.

Speaker's Profile:

Ir. Tan Chin Shu is a Geotechnical Engineer with over 45 years' experience in foundation and geotechnical engineering works and founding Director of Shinei Geotechnique, the company he currently leads. Ir. Tan is a PE registered with the Board of Engineers, Malaysia. He obtained his BSc in Civil Engineering at UMIST University of Manchester and MSc in Foundation Engineering at University of Birmingham. In 1989, Ir. Tan founded Shinei Geotechnique Sdn Bhd as part of the Shinei group of companies. Ir. Tan started his career as an Engineer at Jurutera Consult, (SEA) Sdn. Bhd. where he was mentored by the late Professor Chin Fung Kee. He later joined Kemas Consult Sdn. Bhd. to head their Geotechnical Department. He was involved in the largest Diaphragm Wall Work for the UDA Bukit Nanas Project and the Chung Khiaw Bank Head Quarter, now UOB Bank, at Jln Raja Laut. The site was underlain by treacherous Limestone. Ir. Tan decided to step into the Construction World and was engaged as the Engineering Manager at L&M Prestressing Sdn. Bhd. Here he was very involved in what he termed the "small hole drilling" works such as Ground Anchors & Micropiles. L&M decided to venture into heavy foundations and Bauer was invited to be their Partner. Ir. Tan was then promoted as the Director of LM-Bauer Sdn. Bhd. Now he is dealing with the "large hole drilling works" It was at this period that the Bored Pile industry in Malaysia was revolutionised with the introduction of the Hydraulic Rigs, the BG's and the introduction of Secant pile and post grouting to pile shaft and pile base. After the JV was dissolved, Ir. Tan joined Bauer which soon became a leading Piling Contactor in town. He was much involved in the repair of the Karak Highway and the East-West Highway. There after Chin Shu was invited to be a partner of Pintaras Jaya., primarily dealing in bored pile work then. A year later, in 1991 he set up his own Company, Shinei Geotechnique. The Company now provides a wide range of Geotechnical works from the small hole drilling, such as ground anchor, micropile, underpinning, soil nailing, Slope stabilisation, pressure grouting to the larger hole of bored piling works, that included the largest circular coffer dam in Malaysia, with a diameter of 43 m and to a depth of 21 m in difficult limestone formation works. Shinei also invested in the one of the largest Rotator of 200 t-m torque for multiple layered limestone formation, with double walled casing installed down to a depth of 93 m. Not stopping, Shinei moved on to construct even larger hole up to 3.2 m for hand dug Caisson on slopes and confined locations. Ir. Tan continues to be inspired by challenging geotechnical construction work and the motto of Shinei Geotechnique is "Your Buildings on Solid Foundations."



MODERATOR'S BIODATA

Ir. Rusnida Talib is the Deputy Director at Kuala Lumpur City Hall (DBKL), currently serving as the Head of the Utility Permit Unit within the Civil Engineering and Drainage Department. She holds a Bachelor of Engineering (Hons) in Civil Engineering and an M.Sc in Civil Engineering (Geotechnique) from UiTM, Shah Alam.

With approximately 20 years of experience in roads and bridges projects in Kuala Lumpur, Ir. Rusnida is actively involved with the Institution of Engineers Malaysia (IEM) and the Board of Engineers Malaysia (BEM). She excels in maintaining high work standards, enhancing productivity, and empowering women in STEM.

Passionate about continuous learning and sustainable engineering, she has held various positions within the Women Engineers Section and is currently the Honorary Secretary for the 2024/2025 term. Additionally, she is in the final year of her third term as a Council Member at IEM.

Ir. Rusnida Talib

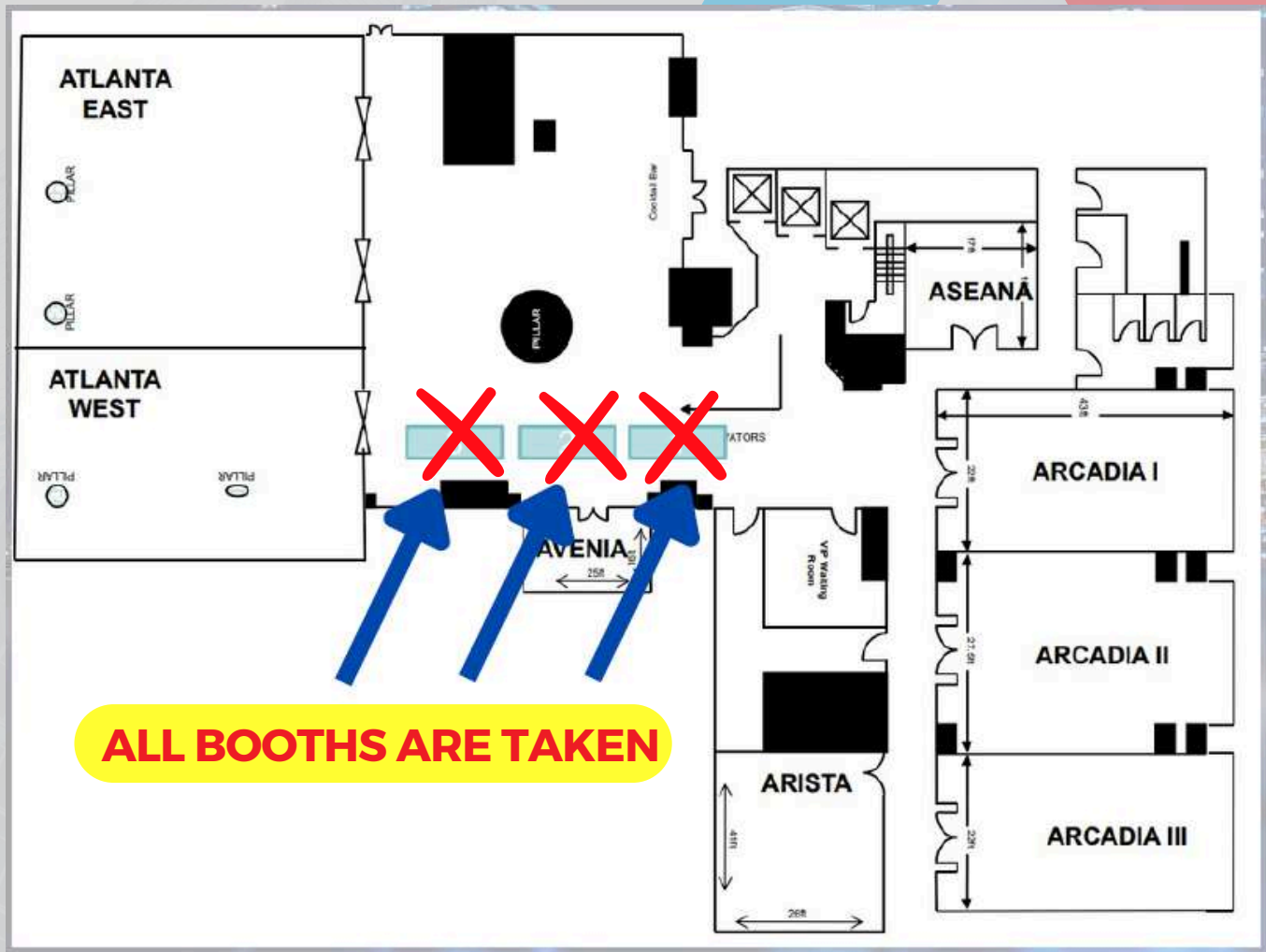


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