

Infrastructure Insights: A Holistic and Practical Approach to Site Investigation, Geotechnical Reporting, and Determination of Design Parameters

Date:

18 June & 19 June
2024

Time:

Day 1
9:00am to 5:30pm

Day 2

9:00am to 4:30pm

Duration:

2-Days

Venue:

LTA HQ, HSO Blk 5
Auditorium,
1 Hampshire Rd,
Singapore 219428

PDU: 11 PDUs

awarded by PEB

Overview:

Well-planned, comprehensive, and meticulous site investigation, correct determination of engineering soil properties, establishment of baselines, and careful selection of design parameters are indispensable for ensuring the safety and cost-effectiveness of infrastructure and tunnelling projects.

It is essential for engineers not to just focus on isolated aspects, but appreciating the interconnected nature of these processes.

This workshop offers participants a holistic understanding of site investigation and design parameter determination, emphasising practical insights and best practices. By exploring the interplay between various stages, attendees will enhance their ability to achieve successful project outcomes.

Workshop Modules:

1. Planning Site Investigations for Above Ground and Underground Infrastructure Projects
2. Best Practices for Site Investigation, and Field and Laboratory Testing
3. Geotechnical Interpretative Report (GIR)
4. Geotechnical Interpretative Baseline Report (GIBR)
5. Interpretation of Field and Laboratory Test Results

Who should attend:

Both seasoned and junior engineers. Engineers working in Agencies, Consultancies, Contracting firms, site investigation and laboratory testing, will find the content particularly beneficial.

Register here: Scan the QR code or visit

https://sit.au1.qualtrics.com/jfe/form/SV_8ughFFu3KxnUR82

Registration Fee: SGD \$600 (incl. GST)

Fees include refreshments & lunch each day, and workshop materials (softcopy)



Organised by **CENTRE FOR INFRASTRUCTURE AND TUNNEL ENGINEERING** jointly established by LTA and SIT with the aim of building engineering industry competency and competitiveness, with a focus on infrastructure and tunnelling.



CITE@singaporetech.edu.sg



<https://www.singaporetech.edu.sg/cite>

SPEAKER PROFILE



Er. Michael McGowan (Arup Singapore Pte Ltd)

Er. Michael McGowan is the Arup Chief Operating Officer for Australasia (Australia, New Zealand, Singapore, Indonesia, Malaysia). Er. McGowan graduated from Trinity College Dublin with First Class Honours in Civil Engineering. Er. McGowan has remained deeply involved in projects throughout his career. With nearly 30 years' experience, he has led and collaborated with partners on large-scale projects for public and private clients across several geographies. In Singapore, his work spans major infrastructure projects including Changi Airport Terminal 5, Cross Island Line, Thomson-East Coast Line, Downtown Line Stages 1, 2 and 3 and North-South Corridor. He has also led nationally important projects for Singapore in areas such as transport solutions for Sentosa and deep underground space use. Er. McGowan is a Fellow of the Institution of Civil Engineers in the United Kingdom and is a registered Professional Engineer in Singapore in the disciplines of civil, geotechnical & tunnel engineering. He lectures on the topic of underground construction and has published papers on seismic and underground design, as well as tunnelling and construction methodologies.



Dr. Chepurthy Veeresh (Land Transport Authority)

Dr. Chepurthy Veeresh is the current Deputy Director, Geotechnical and Tunnels Division of Land Transport Authority, with more than 22 years of experience in the field of Geotechnical Engineering and Tunnelling. His experience include design and project management, preparation of geotechnical interpretation report, evaluation and interpretation of various geotechnical instrumentation data, project planning, site management and supervision for the various projects in Singapore, Malaysia, Hong Kong, Australia, and Vietnam. He obtained his PhD (1997) from Indian Institute of Technology(IIT) Madras, India and has published more than 35 technical papers at international conferences and journals.

SPEAKER PROFILE



Mr. Rudi Julijanto (Kiso-jiban Consultants Co Ltd)

Mr. Rudi Julijanto obtained his BSc in Civil Engineering from Gadjah Mada University, Indonesia in 1995. After his graduation, he started working with Kiso-Jiban company in the Jakarta office. He has worked in Kiso-Jiban office in Singapore since 2001. Rudi has over two decades of experience in the field of geotechnical site investigation in Singapore. His training includes site investigation, both in-situ and laboratory testing, as well as geotechnical instrumentation, and ground improvement techniques. He has applied these skills across a range of projects, including land reclamation, and underground infrastructure projects. He is currently the Deputy General Manager at Kiso-jiban Consultants Co Ltd, Singapore Branch.



Prof. Wong Kai Sin (Singapore Institute of Technology)

Prof. Wong graduated with a BS degree from the University of Illinois and then his Master and PhD degrees from the University of California at Berkeley. He practiced geotechnical engineering in California before joining NTU in 1984. He retired from NTU in 2010 and is currently teaching at SIT as well as actively participating in consultancy works. His major areas of specialisation are deep excavation, building foundation, slope stability, ground settlement, site investigation, site characterisation, soil testing and soil-structure interaction problems.



Assistant Prof. Hartono Wu (Singapore Institute of Technology)

Dr. Hartono Wu is currently an Assistant Professor with the Singapore Institute of Technology. He completed his PhD in Geotechnical Engineering at the National University of Singapore. He teaches courses in geotechnical engineering at SIT and contributes actively as a consultant on various geotechnical projects. His areas of specialisation encompass offshore and coastal geotechnics, geotechnical site characterization, foundation system, numerical modelling, and deep excavation.

MODULES DETAILS

Topic	Speaker
<p>1. Planning SI for above ground and underground infrastructure projects</p> <p>A. Desk Study Project location; geological formation; topography; project details and requirements; stages/phases of investigation; availability of existing BH logs</p> <p>B. Planning for Additional Boreholes (BH) Number of additional BH; locations of BH; termination criteria; types of drilling; types and frequency of field and laboratory tests; types of soil and rock sampling; ground water level</p> <p>C. Site Visit and Damage Assessment Types of surrounding structures; location and proximity; performance of existing structures and potential damages to these structures</p> <p>D. Progress of Site Work Progress monitoring; review of soil conditions from field logs; assess the need to modify the drilling and testing program</p> <p>E. Soil and rock characteristics of major geological formations Bukit Timah Formation; Jurong Formation; Old Alluvium Formation; and Kallang Formation</p> <p>F. Other important considerations Geophysical survey; tidal levels; artesian ground water; drilling and testing of environmental BH samples; potential geotechnical hazards</p>	<p>Er. Michael McGowan (Arup)</p>
<p>2. Best Practices for Site Investigation, and Field and Laboratory Testing</p> <p>A. Site Investigation Utility detection; clearance from various authorities; predrilling briefing to driller; site observation of drilling and sampling practice; daily update on drilling progress; notification to driller on changes to drilling program whenever necessary; assignment of lab tests; good and bad practices on sample handling and storage; sample extrusion; sample trimming; sample preparation and testing; decision on the need for additional BH before driller leaves the site.</p> <p>B. Field tests - Highlighting the good and bad practices Standard penetration test (SPT); vane shear test (VST); cone penetration test (CPT); pressuremeter test (PMT); and field permeability test (FPT)</p> <p>C. Laboratory tests – Highlighting the good and bad practices Index property tests; consolidation test; unconsolidated undrained triaxial compression test (UU); consolidated undrained triaxial compression test (CU); consolidated drained triaxial compression test (CD); permeability; chemistry tests</p> <p>D. Sample Disturbance Sources of sample disturbance with special focus on (i) sampling involving thin-walled sampler, piston sampler and Mazier sampler and (ii) sample trimming using piano wire, knife blade and small tube.</p>	<p>Mr. Rudi Julijanto (Kiso-jiban Consultants Co Ltd)</p>

MODULES DETAILS

Topic	Speaker
<p>3. Geotechnical Interpretative Report (GIR)</p> <p>A. GIR as part of the Geotechnical Design Report</p> <p>B. What should be included in the GIR:</p> <ul style="list-style-type: none"> • A description of site and its topography and the planned construction • All appropriate geotechnical information • All potential geotechnical hazards • Field reconnaissance of the project site and the surrounding area • Site history (e.g. use of historical maps, reclamation history, etc. in interpreting soil parameters in the context of consolidation) • Performance of existing structures at project site and the surrounding area • A factual account of all field and laboratory investigations • Detailed interpretation of factual account of all field and laboratory investigations. • Derivation of design soil and rock parameters • Soil stratification and cross-section profiles • Proposal of further field and laboratory investigations 	<p>A. Prof. Hartono Wu (SIT)</p>
<p>4. Geotechnical Interpretative Baseline Report (GIBR)</p> <p>A. What is GIBR?</p> <p>B. Is it a technical or commercial document?</p> <p>C. What are the parameters that need baseline values?</p> <p>D. How does the developer set the baseline values?</p> <p>E. If the soil condition is very favourable, can the contractor use higher parameters in the design and share the cost savings with the developer?</p> <p>F. If the soil condition is very unfavourable which resulted in a more expensive design, will the contractor be compensated for the higher construction cost?</p> <p>G. Some case histories</p>	<p>Dr. Veeresh (LTA)</p>
<p>5. Interpretation of Field and Laboratory Test Results</p> <p>A. Index property tests</p> <p>B. Consolidation tests</p> <p>C. Undrained shear strength (s_u or c_u)</p> <p>D. Drained shear strength (c' & ϕ')</p> <p>E. Soil stiffness (E_{ur}, E', E_{50}, E_{ur} and E_{oed})</p>	<p>Prof. Wong Kai Sin & A. Prof. Hartono Wu (SIT)</p>

PROGRAMME

Infrastructure Insights: A Holistic and Practical Approach to Site Investigation and Design Parameters Optimisation

DAY 1

Time	Topic	Speaker
9:00am – 10:30am	1. Planning SI for above ground and underground infrastructure projects	Er. Michael McGowan (Arup)
10:30am – 11:00am	BREAK	
11:00am – 1:00pm	2. Best Practices for Site Investigation, and Field and Laboratory Testing	Mr Rudi Julijanto (Kiso-jiban)
1:00pm – 2:00pm	LUNCH	
2:00pm – 3:30pm	3. Geotechnical Interpretative Report (GIR)	A. Prof. Hartono Wu (SIT)
3:30pm – 4:00pm	BREAK	
4:00pm – 5:30pm	4. Geotechnical Interpretative Baseline Report (GIBR)	Dr. Veeresh (LTA)

DAY 2

Time	Topic	Speaker
9:00am – 9:30am	5.1 Introduction	Prof. Wong Kai Sin (SIT)
9:30am – 11:00am	5.2 Interpretation of Consolidation Test Results	Prof. Wong Kai Sin (SIT)
11:00am – 11:30am	BREAK	
11:30am – 12:30pm	5.3 Interpretation of UU Test Results	Prof. Wong Kai Sin (SIT)
12:30pm – 1:30pm	LUNCH	
1:30pm – 2:30pm	5.4 Interpretation of CU and CD Test Results	Prof. Wong Kai Sin (SIT)
2:30pm – 3:00pm	BREAK	
3:00pm – 4:30pm	5.5 Estimation of Soil Stiffness	A. Prof. Hartono Wu (SIT)

DIRECTIONS TO LTA AUDITORIUM



The Auditorium is located at **LTA HSO, Blk 5.**

As there are limited parking lots available, visitors are encouraged to take public transport.

Nearest MRT station, Little India (**NE7 / DT12**), **Exit F.**

Directions on OneMap

<https://www.onemap.gov.sg/?lat=1.3088584&lng=103.8493845>



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