ASSOCIATION OF CONSULTING ENGINEERS SINGAPORE

ACES Courses Series on Eurocode 7 : Ground Model and Ground Improvement; and Geotechnical Instrumentation and Monitoring for Engineers

Date: 17, 18 & 19 March 2026 (Tue/Wed/Thu)
Time: 9.00 am to 12.30 pm
Mode of Delivery: In-person
Venue: ACES Office at 18 Sin Ming Lane
#06-01 Midview City S573960
Fee: $300 nett per person for ACES Member
$450 nett per person for Non-Member / RE/RTO
CPD: PDU to be confirmed

Registration Link
https://forms.gle/S5eeonKdFP9zbrwz8

Session 1: Next Generation Eurocode 7 on Ground Model and Ground Improvement	17 March 2026 (Tue) 9.00 am to 12.30 pm.
Session 2: Geotechnical Instrumentation, Monitoring, Standards and Practice	18 March 2026 (Wed) 9.00 am to 12.30 pm.
Session 3: Instrumentation, Monitoring, and Decision-Making in Geotechnical Engineering	19 March 2026 (Thu) 9.00 am to 12.30 pm.

Course Objective

Geotechnical projects involve significant uncertainty in ground and groundwater conditions. This course covers the Ground Model that is introduced in the next generation of Eurocode 7, explaining its role and use in the project-specific design process, risk identification, and improved understanding of ground behaviour. The course also covers ground improvement in the new unified Eurocode 7 design framework that aligned with partial factor principles.

Geotechnical instrumentation and monitoring are essential for understanding ground behaviour, verifying design assumptions, providing contractual and legal protection, supporting cost control, managing risks and enhancing confidence in design and construction outcomes. These data support analysis, predictive modelling, and informed decision-making throughout the design and construction stages. This course provides a practical overview of current practices, standards and technology, with a strong focus on data interpretation, engineering judgement, and day-to-day decision-making. The course draws on practical experience and case studies related to pile behaviour, deep excavation, embankment and cut slope stability, and ground improvement work, enabling practitioners to apply monitoring results effectively both on site and during design review.

Trainer: Er. Yang Kin Seng

Er. Yang Kin Seng was a former Director with the Building and Construction Authority, regulating and overseeing the safety of buildings and geotechnical building works under construction in Singapore, and headed the Singapore Geological Office. Er. Yang has also served with the now defunct Public Works Department as Assistant Chief Civil Engineer, Head (Roads, Planning and Design) and Head of Geotechnical Engineering, Site Investigation, Instrumentation and Laboratories. He was the Chief Project Manager (Singapore) for the Singapore-Malaysia Second Crossing. He has published more than 40 papers in International conferences and seminars, and peer-reviewed journals. He co-chaired the SPRING (Singapore) Eurocodes Review Advisory Committee, and the Technical Committee on Civil and Geotechnical Works. He is a Professional Engineer and a Specialist Professional Engineer registered with the Professional Engineers' Board, and a Specialist Accredited Checker whilst in Building and Construction Authority.

Session 1: **Next Generation Eurocode 7 on Ground Model and Ground Improvements**
Duration: 3 hours

Course Outline
1) What is the Ground Model?
2) Assembling and developing the Ground Model
3) Classification of Ground Improvement
4) Design methodology and framework for Ground Improvement
5) Analysis, design verification and testing

The next generation of Eurocode 7 introduces the Ground Model as a tool in the design process that is used to advance knowledge of the ground and groundwater characteristics within the zone of influence of the structure and to help identify the corresponding risks. This session provides an understanding of the concept, use and assembling of the Ground Model for identifying project-specific and site specific critical ground and groundwater risks and properties.

The current Eurocode 7 does not cover ground improvement. The next generation of Eurocode 7 introduces and provides a unified design methodology that aligns with the partial factor principles in Eurocode 7. This session presents the classification and shows how the ground improvement is applied, analysed and modelled in the design of such geotechnical works provided in the next generation Eurocode 7.

Session 2: **Geotechnical Instrumentation, Monitoring, Standards and Practice**
Duration: 3 hours

Course Outline
1) Importance of Geotechnical Instrumentation
2) Regulations and Eurocode 7 requirements
3) Types of Instruments and Monitoring
4) Groundwater & Pore Pressure Measurements
5) Instrumentation and monitoring for
    a. Piled foundation for high-rise structure
    b. Deep excavation
    c. Cut slope
    d. Land reclamation
        i. Embankment stability on soft ground
        ii. Ground Improvement

This session provides an overview of geotechnical instrumentation and monitoring for building and civil engineering projects, with particular reference to building control regulations, relevant standards, and the requirements of Eurocode 7. It explains and illustrates the types, functions and applications of geotechnical instruments used to measure deformation, pore water pressure, strain, load, and earth pressure. The session focuses on the use in deep excavation, ground improvement work, stability of embankment and cut slope, and piled foundation projects.

Session 3: **Instrumentation, Monitoring, and Decision-Making in Geotechnical Engineering**
Duration: 3 hours

Course Outline

1) Instrumentation in Construction Environments
2) Monitoring During Construction
3) Data Interpretation and Engineering Judgment
4) Applicability of the Observational Method
5) Modern Trends in Geotechnical Monitoring
6) Case studies: Could Artificial Intelligence (AI) have helped?
    - Deep excavation collapse at Nicoll Highway
    - Tilted high-rise building on piled foundation at Church Street

This session examines the role of geotechnical instrumentation and monitoring in managing construction risk and supporting engineering decision-making. It covers the practical realities of instrument survivability and monitoring during construction, including the use of alert systems and response protocols. The session emphasizes the interpretation and analysis of monitoring data, the exercise of engineering judgement, and effective communication to support timely and informed decisions. The discussion will also include modern trends in geotechnical monitoring, the emerging use of artificial intelligence (AI) to support data driven decisions and the application of the Observational Method in integrating monitoring data into adaptive design and construction control.

The session draws lessons from significant case histories, including the collapse of a deep excavation at Nicoll Highway and the tilting of a high-rise building at Church Street in Singapore, to illustrate how monitoring data inform judgement, risk management, and timely intervention.