Technical Talk on Applications of Fibre Optic Sensing Technology in Civil Engineering

SYNOPSIS

Recent advancement in optical fibre sensing technologies provides the opportunity to verify the engineering performance of structures and subsequently creating a greater confidence in designs, and accurately predicting a structure’s response to its loading environment and providing validation and feedback into the design process. Two types of established fibre optic sensing system that are practically applied in civil engineering are Distributed Fibre Optic Sensing System (DFOS) and Fibre Bragg Grating (FBG) system. The Distributed Fibre Optic Sensing System (DFOS) measures static continuous strain profile which can improve the understanding of the behaviour of civil structures, i.e. deformations, integrity, and provides better insight of the overall structural behaviours. These are very difficult to be achieved by using conventional discrete sensors. The Fibre Bragg Grating (FBG) system is suitable for dynamic measurement with very high measuring frequency, i.e. up to 1000 measurements per second. Other advantages of fibre optic sensing technologies include suitable for long distance measurement, minimal signal loss, resistance to corrosion, chemical, extreme weather and electromagnetic field. This talk will briefly cover the application of the fibre optic sensing system within civil infrastructures, particularly emphasis on the applications in structural health monitoring and deep foundation testing. To further illustrate the advantages of the fibre optic sensing technologies, several case histories using Distributed Fibre Optic Sensing System and Fibre Bragg Grating System will be presented.

SPEAKER

Dr. Regine Lee Siew Cheng obtained her BSc (Civil) from University Sains Malaysia in the year 2012. She continued her postgraduate study in Geotechnical Engineering at University Malaya and obtained her Doctor of Philosophy (PhD) in the year 2018. During her postgraduate study, she worked as a Geotechnical engineer in Gamuda Engineering Sdn Bhd to oversee the Geotechnical works especially on bored pile foundation design and construction of the MRT line 2. She is currently a senior engineer in Smart Sensing Technology Sdn Bhd mainly involved in Geotechnical design and testing. She has vast experience in the design of conventional top loaded pile load test and Bi-Directional Static Load Test instrumented with fibre optic strain sensor. She has great hands-on experience in structural health monitoring using fibre optic sensing system and involved directly with some big scale structural health monitoring project locally and internationally. Recent years, Smart Sensing Technology Sdn Bhd provides fibre optic sensing systems worldwide, i.e. Kazakhstan, Singapore, Indonesia, Cambodia and Bangladesh and Dr Regine is one of the key personnel who was involved and managed those projects from design, installation, monitoring to data analysis and interpretation.

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time: 10.00 a.m. – 11.30 a.m.

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