

You are cordially invited to the Seminar organized by the NTU-JTC Industrial Infrastructure Innovation Centre

## Seminar on

# The underground - an important resource

### Seminar Topic:

There is a fact that during the last 30 years the number of cities with underground metros has increased from approximately 30 to in the order of 100. Going underground is an everyday experience for a large number of people around the world. However, utilisation of the underground for other purposes than traffic tunnels is not so well known for the general public. How can caverns excavated in rock be used in urbanised areas for a wide variety of purposes?

In the seminar, the speaker would introduce a number of examples of caverns used for various storage purposes such as storing of food, drinking water, oil and other liquid hydrocarbons, pressurised gas and air and industrial waste. In addition, the use of caverns for industrial and municipal installations like water and sewage treatment plants will be described. Dual purpose caverns used as civil defence shelters in war time and for entertainment and recreation like sportshalls and swimmingpools in peace time are discussed as well.

### About the Speaker:

Professor Einar Broch, former President of the International Tunnelling Association (ITA) and Editor-in-Chief of the Journal "International Journal for Tunnelling and Underground Space", holds a M.Sc. Equiv. in Civil Engineering (Norwegian Institute of Technology- NTH), an M.Sc. in Engineering Rock Mechanics (Imperial College of Science and Technology), and a PhD. in Engineering Geology (NTH). He is member of the Norwegian Academy of Technological Sciences and published more than 100 scientific papers. He developed the Point Load Test Method for measuring the uniaxial compressive strength of rock when he was a young scientist which is nowadays still widely used worldwide. In addition, Prof Broch has worked as consultant and technical advisor and participated in the design and construction of a wide variety of projects in more than 20 countries. He has also been the member of Panel of Experts for a number of World Bank projects.

**Date:** Tuesday, 13th January, 2015

**Venue:** CEE Seminar Room A, Block N1, Level B1, N1-B1b-06

**Time:** 1000 to 1100

School of Civil and Environmental Engineering (CEE)

To register for this seminar, please click on the link below, or scan the barcode to register online.

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