

## Report on Evening Lecture on High Performance Microsilica Concrete in Tunnel and Structures

By : *Engr. Dr. Ooi Teik Aun, F.I.E.M., P.Eng.*

The above lecture by Mr. Des King was held on 23 January 2007 at the IEM lecture Hall. Mr. King is an expert in concrete technology with over 40 years of experience. He is currently the Technical Manager of the Norwegian silica fume supplier.

The lecture started at 5:30 p.m. and Mr. King emphasised on the importance of the durability of concrete structures and how it could be accomplished through the use of a high performance concrete strategy.

Durability design for concrete structures is receiving more and more attention in the past decade. Government Departments as well as the private sector have been specifying design life for the design of their new projects. There are many ways to achieve a long design life, and the main concerns are how long design life could be achieved cost-effectively.

Mr. King first dealt with the mechanism of pozzolanic material and in particular the high reactivity of silica fume as the main concrete constituent material to enhance durability and strength. He then explained in details how the various components work together to form the durable concrete.

The factors that would affect the various durability properties, essentially the permeability and chemical reactivity of the concrete matrix to the aggressive agents were explained.



*View of lecture in progress*



*Engr. Dr Ooi Teik Aun presenting a memento to Mr. Des King*

The presentation used past project applications and the supporting research and experimental data. Mr King demonstrated the concepts using simple models and clear illustrations from his PowerPoint slides. Towards the end of the presentation, Mr King emphasised the benefit of using whole life costing for the upfront decision on the choice of protective measures. Cost data extracted from an earlier completed bridge project, which seems to support such an approach, could allow an optimal decision that would significantly reduce future repair costs leave alone the cost of inconvenience brought about by the repair works. Unfortunately, many infrastructure developers are blurred by the upfront capital injection. The use of ternary blends of cement and silica fume was shown to be effective in reducing life cycle costs whilst maintaining early age performance.

The importance of proper curing of concrete was repeatedly emphasised in the course of the lecture.

The presentation was well received with full capacity of the hall of about 130 participants and many interesting questions were raised with probing queries from the floor that extended the lecture to 7:00 p.m.

On behalf of the IEM Tunnelling and Underground Space Technical Division, Dr Ooi presented a token of appreciation to Mr. King and thanked him for his most informative lecture. ■