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Autor: Head, Peter
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Creation, Maintenance and Management of the World's Assets: Appropriate Quality and Technology for the Future

Peter HEAD
Chief Executive
Maunsell Europe
Beckenham, Kent, UK

Peter Head, born 1947, received first class honours degree in Civil Engineering from Imperial College London in 1969. Joined Maunsell in 1980. Design and management of many major bridges including the Second Severn Crossing. Awarded the Royal Academy of Engineering's Silver medal in 1995, received an OBE in 1998 and in 1998 received the IABSE International Award of Merit for innovative work in advanced composite materials.

Summary

The construction industry has lagged behind most other industries in the improvement of quality and reliability of its products. In many ways the search for ever lower capital costs and speed of construction has tended to drive reliability to the bottom of the agenda and clients are now often faced with deteriorating assets with no built in methods of monitoring or yardsticks for judging whether the situation is unsafe for the users or not.

The paper will examine these issues in an open honest way and conclude that designers are currently too willing to repeat the mistakes of the past because engineers are conditioned to follow proven and yet poor practice. There is an underlying dishonesty about what can actually be achieved in many real world situations, a detachment between design and the reality of construction quality and usage.

A new step by step approach will be set out which addresses the key problems, based on the total quality method for the complete system which is used in many other industries. For example vulnerable components should either be avoided or, if this is not possible, protected as much as possible, be able to be monitored and be accessible for maintenance or replacement without compromising the convenience and safety of the users. Accessibility should address not just the situation on opening, but the access available once the asset is overwhelmed by use.

Quality of construction needs to address the complete system and high quality factory produced components will not help unless they can be installed without damage and the joints can be formed in-situ without compromising the whole life integrity. Again if joints are vulnerable they should comply with the above.

Another vital area is flexibility for change of use which is so often ignored in a low material content approach to design and yet can be the key economic issue for the owner.

The paper will aim to set out an approach that can be followed to achieve many innovative approaches to construction which will provide clients with more appropriate lower whole life cost solutions tailored to their needs. Examples will be given of successful applications of these techniques.

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