

## **Mike Webster Case Studies**

### **Hong Kong Buildings Department – Building Safety Inspection System**

- The HKBD was concerned at the number of fatal and major injuries caused by partial collapses of aging and deteriorated steel and concrete building structures, and required an asset management system to identify issues with, prioritise and manage its building stock.
- Mike led the BCA input into the asset management system for investigating problems with buildings in Hong Kong. This involved developing risk-based preliminary and detailed investigation and assessment methodologies and modifications to BS 8110 for use on corroded concrete structures.
- The BSIS provided a two-stage risk-based process for identifying, inspecting and assessing the safety levels of the building stock. It focused effort on the highest risk building structures to deliver cost-effective and consistent management of safety levels.

### **European Commission – CONTECVET: A validated user manual for assessing the residual service life of concrete structures**

- There was concern about the lack of practical guidance for owners of aging concrete infrastructure to make reliable judgements on current and future safety levels and the time for intervention.
- Mike prepared a proposal, presented the project to the EC and gained funding for a 1.5M Euro project. He led a team consisting of fourteen European organisations (including rail, road and energy authorities, car park owners and local authorities) to produce asset management manuals. These manuals provide guidance on investigating, assessing and intervening with deteriorated concrete structures affected by ASR, corrosion and frost damage.
- This provided guidance that focussed investigations and, for the first time, established the time and strategy for intervention/repair.

### **Highways Agency – Bridge Deck Membrane Action**

- With the introduction of 44 tonne vehicles to the UK, there was a need to assess a large proportion of the UK bridge stock to see if they were able to carry the increased loads. However, existing assessment methodologies were intended for design rather than assessment and their results were too conservative.
- Mike undertook research into the state of the art in bridge deck behaviour, design and assessment. This was used to develop methodology for assessing the ‘hidden strength’ of bridge decks resulting from compressive membrane action.

- Mike wrote the first draft of BD81 'The design and assessment of reinforced concrete bridge deck slabs'. The publication of BD 81 potentially saved £Ms in strengthening costs.

#### **Various clients – Investigations and assessments of a range of concrete structures**

- Clients required advice on defects, deterioration, maintenance, remedial measures and whether their structures (including multi-storey car parks, chimneys, oil refineries, industrial structures, power stations, trailer parks and steel, reinforced, prestressed and post-tensioned concrete bridges) were safe or why they had failed.
- Mike led on-site inspections, testing and assessments of structures, producing reports providing advice on the current and future safety and serviceability levels. He also provided recommendations for maintenance and remedial measures.
- This provided insight into why things had gone wrong, assurance to the structures' owners about what the safety levels were and cost-effective plans for future action.

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