THE 8TH INTERNATIONAL CONFERENCE ON DURABILITY OF BUILDING MATERIALS AND COMPONENTS

by
Michael A. Lacasse and Dana J. Vanier
National Research Council Canada

The 8th International Conference on Durability of Building Materials and Components (8th DBMC) hosted by the National Research Council Canada, was held in Vancouver from 30th May to 3rd June 1999. Over 400 people attended the four day Conference and Workshops, and the venue attracted at least 50 more attendees to the nine CIB Commission meetings and the nine ISO meetings organised at the Hyatt Regency Hotel. Over 280 poster and oral presentations formed the technical content of the 8th DBMC and W078 Workshop and these were augmented with eight keynote addresses and lunchtime presentations. Details of the events can be obtained from Michael A. Lacasse at michael.lacasse@nrc.ca

The 8th DBMC represents the most recent triennial conference in the series. The previous seven were held in Ottawa (1978), Gaithersburg (1981), Espoo (1984), Singapore (1987), Brighton (1990), Omiya (1993), and Stockholm (1996).

Background

Asset managers are faced with many difficult decisions regarding when and how to maintain and repair their constructed facilities. The reasons behind these difficult decisions are the growing fiscal constraints, an increasing maintenance deficit and a substantial repair backlog. In addition, asset managers' resources are being challenged from all sides: they are also being asked to cut cost, privatise operations, outsource responsibilities, reduce maintenance and increase efficiency. These problems are exacerbated by the lack of: (1) usable data, (2) information and knowledge related to maintenance, (3) repair and service life prediction techniques, and (4) tools to assist the asset manager to make proper inspection, maintenance, repair and replacement choices.

Many of these problems would be solved if more information exchange were present in the construction industry regarding service life and asset management. Many organisations have in recent years recognised the scope of the problems facing asset managers. Unfortunately existing opportunities offer only partial solutions to many of the problems in asset management. Hence there is a pressing need for research and development in this field. For example: (1) what maintenance data are required to predict service life of materials and components, (2) what are the life cycle costs of maintenance and repair alternatives, (3) what techniques are available for service life prediction, (4) how can performance be quantified using objective and representative indicators (5) how can the likelihood of failure be calculated and the consequences of failure be identified, and finally, (6) how to integrate this information to allow asset managers to make cost-effective and objective decisions on maintenance, repair and renewal alternatives?

It is for these reasons and requirements that the 8th DBMC event focused on Service Life and Asset Management. The principal foci for the event were: (1) service life and durability of materials and components; (2) durability of building assemblies and methods of service life prediction; (3) performance, service life prediction and sustainable construction, and (4) information technology in construction.

Conference Themes

The Conference focused on topics related to integrating existing knowledge together with more recent contributions on service life and durability of construction and building materials, components and assemblies. This included work in the area of service life prediction methods and modelling, field studies and evaluation methods, degradation mechanisms and material characterisation, and related items. It also
provided a forum for new knowledge in the area of service life directly related to: life cycle economics, maintenance management, performance requirement modelling, probabilistic and reliability methods, as well as promoting the integration of this knowledge towards practical applications with emphasis on the use of information technologies as an integration tool. A summary of the conference themes is provided below:

1. Service life prediction
   - Material characterisation, prediction methods and modelling of degradation mechanisms
   - Field Studies and evaluation of in-service performance
   - Measurement and characterisation of degradation environment

2. Probabilistic and reliability methods
   - Applications to service life prediction of materials and components
   - Utilisation in inspection and maintenance of facilities

3. Asset and Maintenance Management
   - Planning and procedures related to service life of construction facilities
   - Inspection and maintenance and rehabilitation forecasting

4. Life Cycle Economics - as it specifically relates to service life and asset management
   - Service life cash flow - expense and revenue estimation
   - Forecasting life cycle capital renewal & rehabilitation expenditures

5. Performance and user requirement modelling

6. Information Technologies in Construction (CIB W078 Workshop)
   - Process tools for service life and asset management
   - Classifying, searching, retrieving and collating service life and asset management data

7. Design for Durability - Service life and "sustainable design"

8. Standardisation and regulations - design life of the built environment
   - Service life testing, evaluation and assessment of materials and components

Two major Workshops were held in conjunction with 8th DBMC. Right from the earliest planning stages Working Commission W078 intended to organise a Workshop on Information Technology in Construction as an integral part of the programme and this extended over the full four days, subsequently a W060 Workshop on Serviceability of Buildings was added. Both these events turned out to be a significant adjunct to the scientific content of the 8th DBMC and attracted substantial participation.

A report on each follows.
W060 Coordinator George Ang and newly appointed Secretary Marleen Hermans have provided a detailed account of what transpired at that Workshop and Dana Vanier has written up the W078 Workshop and is at the disposal of readers for any further information that may be required.

Their cooperation is gratefully acknowledged.
It is worthy of note that both W060 and W078 also held a Commission Meeting during the 8th DBMC.

CIB W078 Workshop on Information Technology in Construction
More recently, attention has been placed on deriving from these sources of information, a means of providing practitioners more ready access to the vast body of knowledge encompassed within studies on the "durability of materials". Moreover, recent advances in information technologies permit its ready use as an integration tool and dissemination device, and a suitable interface to the current and evolving needs of practitioners and researchers. It is in this context that the 8th DBMC provided an unique venue for exhibiting the most recent innovations in information technologies as a tool to link various research fields associated with service life prediction. An expanded summary of the W078 Workshop is to be found on [here](#).

**Proceedings**

The Proceedings have been published in four volumes and are also available on CD-ROM. In addition to the full text of the 8th DBMC proceedings in PDF (Adobe Acrobat's Portable Document Format), the CD-ROM also contains abstracts from over 1500 papers from previous DBMC conferences and related works. A complete description of the publication can be found at: [http://www.nrc.ca/cisti/journals/42738/42738.html](http://www.nrc.ca/cisti/journals/42738/42738.html)

Collectively these contributions provide a detailed view of approaches, methods, techniques, tools, systems and technology used to develop knowledge on the service life durability of construction and building materials, components and assemblies and the integration of this information towards asset management. As such, they also provide an outline of the issues, insights into the research, knowledge of the techniques, and a robust discernment of useful technologies.

These Proceedings will be of interest to construction researchers, practitioners and designers concerned with service life prediction and durability as well as asset managers interested in obtaining knowledge about the most recent innovations currently being considered as management tools. Information technologists will find considerable scope towards the application side of their emerging technologies. See [here](#).

**Annual Meetings and Related Workshops of CIB Commissions**

The Conference was likewise the venue for nine annual CIB Working Commissions' meetings as well as a forum for various co-ordination meetings that respectively focused on research in moisture protection for durable wood, municipal infrastructure investment planning, and information framework for construction. The final item on information framework for construction brought together representatives from four different organisations focused on research and the development of standards for use of information technologies for the construction industry. Represented were the CIB W078 (Information Technology in Construction), ISO-STEP (STandard for the Exchange of Product Model Data), IAI (International Alliance for Interoperability), and the ICIS (International Construction Information Society). Together they sought to outline common ground, bring about exchange of information, and remove duplication of similar work items in the area of information representation.

CIB has a number of annual events that typically bring together various Working Commissions; the 8th DBMC / W078 event thus provided a venue for researchers contributing to the activities of Commissions focusing on building pathology (W086), design for durability (W84), geographic information systems (TG20) and their use in construction, environmental design methods (TG22), information technology in construction (W078), concurrent engineering in construction (TG33), roofing materials and systems (W83), performance concept in building (W60), and prediction of service life of building materials and components (W80/RILEM-175).

**ISO Technical Committee Meetings**

Unique to the organisation of the 8th DBMC Conference was the gathering of nine Technical Committees (TC) that met to review their respective activities over the past year. This represented the single largest gathering of construction-related ISO Technical Committees to date and a significant addition to collaboration among research and standards development agencies. Standards being developed in the area of design life of buildings, performance descriptions on durability of single family
homes, functional and user requirements for performance of constructed facilities, construction terminology and documentation, organisation of construction information, dimensional tolerances, and computer-aided design formed the major components to this group of TC meetings. Early indications from the main committee chair, Prof. K. Apeland, and secretary, Mr. Kjell Bakkmoen, are that this proved to be a singularly successful venture that permitted increased interaction among the various groups and in particular between working groups and their respective sub-committees. Furthermore, the main committee was able to discern the breadth of activities that it administers and gain an understanding of the need for rationalising existing committee work by integrating common activities. As well, these meetings served to foster use of a common understanding of issues in particular in areas such as sustainable construction that are just now emerging on the standardisation agenda. Additional information on the activities of these various TC can be found at: http://www.iso.ch/

9DBMC

The 8th DBMC Steering Committee met to decide, among other things, the venue for the next conference. After submissions from three candidate organisations, each offering an excellent overview of their respective proposals, it was decided that the CSIRO would host the 9DBMC in Australia in 2002. The conference chair, senior researcher, Mr. Stewart Burn, has already taken a number of steps towards making this another successful gathering of interest to both researchers and practitioners. He is actively seeking local support to bring about an unique event that he expects will provide significant contributions as have the previous events organised by the DBMC Committees. Any CIB Working Commission interested in organising their annual meeting in conjunction with the 9DBMC should contact Stewart Burn at: Stewart.Burn@dbce.csiro.au or phone: +61-3-9252-6032.

DINNER CRUISE

The Dinner Cruise Excellence was the keynote of everything associated with the 8DBMC and no event more so than the Dinner Cruise on 1st June.

But then who can visit Vancouver and not make such a journey?

Dana Vanier and Family enjoyed it - and why not since he was one of the main organisers?

Anna Ines Fuente, Michael Lacasse and Liana Bustillos
Top Deck in Front of Expo Building

View of the dramatic mountains that fringe the Harbour

Vasco and Ana De Freitas et al in the Evening

Ralph Paroli, Walt Rossiter and Mostafa Nofal

Wide View after Dinner

RECEPTION

Christer Sjöström

W060 in force at the Reception: George Ang, Marleen Hermans, Bahar Sayil et al. Pekka Huovila can be seen 2nd from left