

# CANADIAN ENGINEERS ADOPT ISIS TECHNOLOGIES

Under the auspices of the CSCE and CSA, the authors of the revised Section 16 of the CHBDC conducted workshops across Canada to explain the use of GFRPs for new and rehabilitated civil structures. Several ISIS personnel were on the committee that rewrote Section 16 and participated in the seminars.

Emphasis was placed on the design and rehabilitation of fibre reinforced structures. This makes the S6-06 the only design code in the world that permits the use of FRPs for strengthening and reinforcement on both new and rehabilitated bridges and structures made of concrete or wood.

**This is the only code in the world that allows GFRPs to be used for the rehabilitation of aging structures.**

With up-to-date design provisions, the CHBDC is considered to be the leading code for bridge design by engineers around the world.

Presenters (ISIS participants in red):

- B. Bakht
- B. Benmokrane
- A. Caron
- H. Ibrahim
- I. Leclerc
- J. Newhook
- D. Rogowsky
- G. Tadros

## THE NEW CSCE-CSA CANADIAN HIGHWAY BRIDGE DESIGN CODE SEMINARS



Vancouver, BC	Calgary, AB	Edmonton, AB	Moncton, NB	St. John's, NL
Toronto, ON	Ottawa, ON	Montréal, QC	Québec, QC	Winnipeg, MB

### CHBDC Fibre Reinforced Structures Technical Subcommittee:

Aftab Mufti, Chair	Baidar Bakht	Nemkumar Banthia	Brahim Benmokrane	Mark Braiter	Gérard Desgagné
Ruth Eden	Marie-Anne Erki	Vistasp Karbhari	Jadwiga Kroman	David Lai	Atsuhiko Machida
Kenneth Neale	John Newhook	Shamim Sheikh	Gamil Tadros	Björn Täljsten	



# ISIS ANNUAL CONFERENCE

200 delegates from the ISIS Canada Research Network, industry and government participated in this very successful conference. Presentations were made by several ISIS project leaders, students, postdoctoral fellows and research associates. A poster competition highlighting current ISIS research projects was once again a key feature of the conference. Three scholarships were presented at the conference: The Joanne Keselman Scholarship for Women in Engineering; the Leslie Jaeger Scholarship for the Advancement of Engineering; and the Urs Meier Scholarship for Engineering Excellence.



**Student Committee President,**  
Hart Honickman,  
Queen's University

## FRPs are REAL

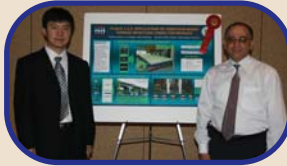
## NO LONGER EXPERIMENTAL

### 2007 STUDENT POSTER COMPETITION WINNERS

#### THEME 1 - Intelligent Sensing and Structural Health Monitoring

##### 1st PLACE

Yufeng Wang, Mazin Alwash, Yang Sun  
University of Saskatchewan



##### 2nd PLACE

Bruno Thériault, Benedikt Weber  
Université de Sherbrooke

##### 3rd PLACE

Jian Huang  
Dalhousie University

#### THEME 2 - Materials Science and Innovative Structures

##### 1st PLACE (and BEST OF CONFERENCE)

Ershad Chowdhury,  
Masoud Adelzadeh,  
Xiumei Duane  
Queen's University



##### 2nd PLACE

Jeff Mitchell,  
Hart Honickman,  
Jekuk Son  
Queen's University

##### 3rd PLACE

Walid Elsayed,  
Ahmed Godat,  
Hussien AbdelBaky  
Université de Sherbrooke

#### THEME 3 - Structural Strengthening and Rehabilitation with FRPs

##### 1st PLACE

Sylvio Tam, Michael Colalillo,  
Jang Tao Liu, Ciyun Cui  
University of Toronto



##### 2nd PLACE

Moataz Badawi,  
Ahmed El Refai  
University of Waterloo

##### 3rd PLACE

Peter Mitchell, Paul Burke  
Queen's University



Visit our website at [isiscanada.com](http://isiscanada.com) for more details.

## 2007 STUDENT SCHOLARSHIP WINNERS

### Leslie Jaeger Scholarship for the Advancement of Engineering

Mathieu Robert,  
Université de Sherbrooke



### Joanne Keselman Scholarship for Women in Engineering

Noran Abdel-Wahab,  
University of Waterloo



### Urs Meier Scholarship for Engineering Excellence

Theresa Casey,  
University of Alberta



### Student Award of Merit

Hussien AbdelBaky,  
Université de Sherbrooke



## 2007 STUDENT PRESENTATION AWARDS



### MSc Presentation - First Place

Paul Burke,  
Queen's University  
"Temperature Effects on the Performance of  
Near Surface Mounted FRP Reinforcement for  
Concrete Structures"



### MSc Presentation - Second Place

Sylvio Tam,  
University of Toronto  
"Durable Retrofitting of Concrete Structures"



### MSc Presentation - Third Place

Nicholas Lawler,  
University of Waterloo  
"Punching Shear Retrofit of RC Flat Slab-  
Column Connections Using FRP Reinforcement"



### PhD/RA Presentation - First Place

Mohamed Eisa,  
Université de Sherbrooke  
"New Continuous Reinforced Concrete  
Pavement (CRCP) Using GFRP Bars"



### PhD/RA Presentation - Second Place

Walid Elsayed,  
Université de Sherbrooke  
"Studies on Mechanically Fastened FRP-  
Strengthening Systems"



### Best Overall Graphics, MSc

Jeff Mitchell,  
Queen's University  
"Bridge Overhead Sign Structures Using FRP  
Tubes Partially-filled with Concrete for Local  
Buckling Control"



### Best Overall Graphics, PhD/RA

Weawkamol Leelapornpisit,  
Concordia University  
"Evaluation on the Fire Endurance of FRP  
Laminate Composites Enhanced by Nanoclay"



# USER SECTOR SUPPORT PROVIDED BY ISIS CANADA

**Based on a decade of research and field demonstrations, ISIS Canada has provided the following reference material to enable civil design engineers and contractors to take full advantage of ISIS technologies:**

- Updated **design manuals** with new case studies
- Revised edition of **CHBDC** (Canadian Highway Bridge Design Code), Chapter 16
- Durability **monograph** for FRPs in civil infrastructure
- Guidelines for **repair and rehabilitation** of concrete structures reinforced with glass FRPs
- Guidelines for **product certification** of FRP materials
- Established **service life of GFRP** reinforced concrete deck slabs at 100 years through Life Cycle Engineering and costing models
- **Specifications** for the application and construction installation for Structural Health Monitoring (SHM)
- Established the **SHM Support Centre** in Manitoba with access nodes across the country
- **Education training modules** for undergraduates, practicing engineers and technicians in the design and application of FRPs and SHM
- **Workshops** on Life Cycle Engineering and Costing to evaluate the relative merits of various material options for reinforcement and strengthening of civil structures
- **Opportunity** for participation in the international societies of **ISHMII** (International Society for Structural Health Monitoring of Intelligent Infrastructure) and **IIFC** (International Institute for FRP in Construction)



# GLOBAL OUTREACH OF ISIS CANADA

## Dr. Kenneth Neale, Ph.D., Ing., FCAE, FCSCE, President of IIFC



Formerly based in Hong Kong, China, the IIFC (International Institute for FRP in Construction), is now headquartered at ISIS Canada in Winnipeg, Canada with the appointment of Dr. Kenneth Neale as president.

The IIFC was established in March 2003 with the aim of advancing the understanding and the application of FRP composites in the civil infrastructure, in the service of the engineering profession and society. The activities of the IIFC include the organization and sponsorship of international conferences, symposiums, workshops, short courses and seminars, the establishment of working groups in selected areas to develop state-of-the-art reports and design recommendations, and the development of curricula and course materials to meet educational needs at different levels.

Dr. Neale is Vice-President and a founding member of ISIS Canada, is Director of Theme 3 and sits on the Research Management Committee. Dr. Neale is also a Canada Senior Research Chair in Advanced Engineered Material Systems at the Université de Sherbrooke, and has been appointed by the Standards Council of Canada to Chair the ISO TC71 SC6 committee.

## Dr. Aftab Mufti, Ph.D., P.Eng., FCSCE, FEIC, FASCE, FCAE, President of ISHMII



From its inception in 2003, ISHMII (International Society for Structural Health Monitoring of Intelligent Infrastructure) has been headquartered at ISIS Canada in Winnipeg, Canada with Dr. Aftab Mufti serving as founding president.

The ISHMII mandate is to advance the understanding and the application of Structural Health Monitoring (SHM) in the civil engineering infrastructure within the engineering profession and society. ISHMII promotes collaboration to maximize the benefit of the international research and development effort, encourages owners of infrastructure to build intelligent infrastructures that last more than 100 years, furthers the acceptance of SHM by establishing performance-based codes within the engineering community and beyond as a major performance measuring device, and provides a focal point for international sharing of knowledge and experience.

Dr. Mufti is President and a founding member of ISIS Canada, who chairs the Research Management Committee. Dr. Mufti is also a Professor of Civil Engineering at the University of Manitoba and was one of the key persons to initiate interest in the uses of Advanced Composite Materials (ACM) for Civil Engineering structures in Canada. In 2005 he received the Mirko-Roš Award for his outstanding life's work in research and education from EMPA in Switzerland, the only Canadian to receive such an honour.

### ISIS Canada has memoranda of understanding with:

- Drexel University, USA
- Universidad Santa Maria La Antigua, Panama
- University of California, San Diego, USA
- University of Edinburgh, Scotland
- King Fahd University of Petroleum & Minerals, Saudi Arabia
- Sir Syed University of Engineering & Technology, Pakistan
- Nagaoka University of Technology, Japan
- India Institute of Technology, India
- University of Mexico, Mexico



# HONOURS & AWARDS

## PRESIDENT

Aftab Mufti, Ph.D., P.Eng.  
University of Manitoba

## VICE PRESIDENT

Kenneth Neale, Ph.D., Eng.  
Université de Sherbrooke

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Nemkumar Banthia, Ph.D., P.Eng.

University of British Columbia

Xiaoyi Bao, Ph.D.

University of Ottawa

J.J. Roger Cheng, Ph.D., P.Eng.

University of Alberta

Andrew Horosko, P.Eng.

Manitoba Infrastructure and Transportation

Leslie Jaeger, C.M., Ph.D., P.Eng.

Consulting Engineer

Lloyd McGinnis, O.C., Ph.D., P.Eng.

ISIS Canada

Kenneth Neale, Ph.D., Eng.

Université de Sherbrooke

Gamil Tadros, Ph.D., P.Eng.

SPECO Engineering Ltd.

Douglas Thomson, Ph.D.

University of Manitoba

Observer: Alain Canuel, Ph.D.

NCE Program Officer

## TECHNICAL APPLICATIONS CONSULTANT

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SPECO Engineering Ltd.

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Chief Executive Officer

Observer: Alain Canuel, Ph.D.

NCE Program Officer

Observer: Leslie Jaeger, Ph.D., P.Eng.

Observer: Hart Honickman

President, Student Committee

## Innovator Newsletter

Editor: Kim Hes-Jobin

Kim\_Hes-Jobin@UManitoba.CA

## ISIS Canada Research Network

The University of Manitoba

A250 Agricultural & Civil Engineering Building

96 Dafoe Road

Winnipeg, Manitoba Canada R3T 2N2

Phone 204. 474. 8506

Fax 204. 474. 7519

E-mail central@isiscanada.com

Website www.isiscanada.com



## Leslie Jaeger, C.M., D.Sc., D.Eng., LL.D., FCAE, FEIC, FCSCE, FRSE, P.Eng.

As part of the 2007 International Symposium on Integrated Life-Cycle Design & Management of Infrastructures in Shanghai, China, sponsored by Tongji University, a special session was organized to honour Dr. Jaeger, who has been a research professor of this institution for many years. Several ISIS personnel made presentations exhibiting the advancement of ISIS technologies during this special session. Dr. Jaeger is one of the founders of ISIS Canada and continues to be a consultant for the organization.



## Amir Fam, Ph.D., P.Eng.

ISIS Canada would like to congratulate Dr. Amir Fam, ISIS Canada Project Leader and an Associate Professor and Canada Research Chair in Innovative and Retrofitted Structures at the Department of Civil Engineering of Queen's University, for receiving the **2007 T.Y. Lin Award** from the American Society of Civil Engineers for the paper, "Modeling of Prestressed Concrete-Filled Circular Composite Tubes Subjected to Bending and Axial Loads," Journal of Structural Engineering, March 2006.



## Nemkumar Banthia, Ph.D., P.Eng.

Dr. Nemkumar Banthia, ISIS Canada Project Leader and Professor of Civil Engineering and Distinguished University Scholar at the University of British Columbia, has been appointed as **Treasurer of the IIFC** (International Institute for FRP in Construction).



## Vidyadhar Limaye, Ph.D., P.Eng.

Dr. Vidyadhar Limaye has been named **Vice-President, Engineering and Innovation for The MacDonnell Group Consulting Limited**. ISIS Canada would like to congratulate its ISIS graduate on this new position and looks forward to continuing its working relationship with The MacDonnell Group.

