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## CSA-S806: Design and Construction of Building Components with Fibre- Reinforced Polymers

### A One-Day Workshop

Vancouver, BC- December 5, 2003- 8:00-4:30

Best Western Chateau Granville, 1100 Granville St., Vancouver, BC V6Z 2B6

## Guide CSA-S806

#### Course Description

Since fibre-reinforced polymers (FRP) are increasingly gaining acceptance as an alternative to traditional reinforcing materials in aggressive environments, the Canadian Standards Association has developed the world's first full standard, called "S806-02: Design and Construction of Building Components with Fibre-Reinforced Polymers," for the design and retrofit of building components with FRP reinforcement. This course will cover the background to the various code provisions, define their scope and through detailed examples demonstrate their applications.

The standard deals with reinforced and prestressed internal reinforcement consisting of bars and grids and with external reinforcement comprising surface bonded sheets and laminates. It covers the ultimate limit state analysis and design of members under flexure, axial load or shear as well as serviceability limit state requirements such as crack width and deflection. The detailed provisions of this standard make it possible now to apply FRP in a systematic and safe way in the retrofit, strengthening and design of new building structures.

#### Special Offer

A purpose-designed binder containing comprehensive information will be provided to each participant, which will include charts, graphs, and tables that are included in the presentation of each topic. Adequate time for questions will be provided.

#### The Presenters (members of the CSA-S806 Technical Committee)

**Dr. Brahim Benmokrane, P. Eng.** Is a Professor of Civil Engineering at University of Sherbrooke. He has been involved in the design, construction, and monitoring of five FRP reinforced concrete bridges constructed in Canada and USA.

**Don Lamb, P.Eng.** is the Manager of Engineering Services at Master Builders Technologies Ltd. He has been involved in concrete materials throughout Canada for thirty years. He is a member of ACI and several CSA Technical Committees.

**Dr. David T. Lau, P.Eng.** is a Professor of Civil Engineering at Carleton University. He has served as consultant in numerous industry and government projects on vibration and seismic problems of structures in Canada, California and overseas.

**Ghani Razaqpur, Ph.D., P.Eng.** is a Professor of Civil/ Environmental Engineering at Carleton University. He has published many technical papers on FRP design and applications, and the results of his research are reflected in the S806-02 provisions.

**Dr. Murat Saatcioglu, P.Eng.** is a Professor of Civil Engineering and Research Chair at the University of Ottawa. His research interests include the behaviour and design of steel and FRP reinforced concrete structures with emphasis on seismic performance, retrofit and design.

**Dr. Dagmar Svecova** is an Assistant Professor of Civil Engineering at the University of Manitoba. She is a Project Leader with ISIS Canada, a national network of centres of excellence, and has co-authored ISIS Design Manual 3 for FRP reinforced concrete.



[www.csce.ca](http://www.csce.ca)



## AGENDA

- 8:00- Registration
- 8:30- General code philosophy, limit states and other background material  
*G. Razaqpur*
- 8:45- Material properties, load and resistance factors  
*B. Benmokrane/ G. Razaqpur*
- 9:45- Coffee Break
- 10:00- Internally reinforced concrete design: flexure, shear, deflection, crack width, bond  
*B. Benmokrane/ G. Razaqpur*
- 11:30- Construction issues  
*G. Razaqpur/ D. Lamb*
- 12:00- Lunch
- 1:00- Prestressed concrete design  
*G. Razaqpur/ D. Svecova*
- 2:30- Coffee Break
- 2:45- Column confinement, column retrofit by wrapping  
*M. Saatcioglu/ D. Lau*
- 3:30- Retrofit for enhanced flexural and shear strength, seismic retrofit  
*M. Saatcioglu/ D. Lau*
- 4:30- End

## CONTACT INFO

#### INFORMATION AND REGISTRATION

**Kar-Wei Cho**  
Events Coordinator CSCE  
T: (514) 933-2634 ext. 29  
F: (514) 933-3504  
E-mail: [events@csce.ca](mailto:events@csce.ca)

*This course is recognized by*



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Government Services  
Canada

# REGISTRATION

Please fax or mail this form with your payment to: Kar-Wei Cho, Events Coordinator,  
CSCE, 4920 de Maisonneuve Blvd.W., Suite 201, Montreal, QC H3Z 1N1, F: (514) 933-3504

**CSA-S806 Vancouver, December 5, 2003**

Name \_\_\_\_\_ Date \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

E-mail \_\_\_\_\_ Tel \_\_\_\_\_ Fax \_\_\_\_\_

CSCE Membership Number \_\_\_\_\_

(1) My Professional Specialty is \_\_\_\_\_

(2) At the end of the session, I will evaluate it as a success if it responds to my following objective(s)  
\_\_\_\_\_

**I authorize CSCE to send my participation record to EIC for CE units registration.  YES  NO**

*Enrollment is limited to assure interaction is personalized and encouraged.*

*Group (5 or more) and student rates are available upon request.*

*Join CSCE now at the introductory price of \$90 + taxes and pay the CSCE member fee at this and other workshops during the coming year.*

*Any registrant may substitute another person eligible for the same registration fee without charge at any time. Full refund will be issued when a written notice of withdrawal is received 2 weeks before the first day. An administrative fee is deducted at this time. We regret that there will be no refunds issued past this date. In the event that CSCE must cancel the program, the participant will receive a 100% refund for workshop fees.*

# PAYMENT

Please check as appropriate to you. Dates refer to receipt of registration materials by CSCE. Payment must be received to confirm your place. Refreshments, lunch, course materials and manual are included.

Registration Fees	Early Registration (On or before Nov. 14, 2003)	Open Registration (After Nov. 14, 2003)
CSCE Member	\$200 + tax = \$214.00 <input type="checkbox"/>	\$250 + tax = \$267.50 <input type="checkbox"/>
Newly Enrolling CSCE Member	\$300 + \$90 + tax = \$417.30 <input type="checkbox"/>	\$350 + \$90 + tax = \$470.80 <input type="checkbox"/>
Non-CSCE Member	\$420 + tax = \$449.40 <input type="checkbox"/>	\$470 + tax = \$502.90 <input type="checkbox"/>

Registrant Signature \_\_\_\_\_ Registration Date \_\_\_\_\_

**Method of Payment** (Check as appropriate to you)

VISA  MASTERCARD  CHEQUE ENCLOSED (payable to Canadian Society for Civil Engineering)

Credit Card Number \_\_\_\_\_ Expiry Date \_\_\_\_\_

# MEMBERSHIP APPLICATION

**PLEASE PRINT CLEARLY.**

Name \_\_\_\_\_ Date of Birth \_\_\_\_\_ Sex \_\_\_\_\_

Indicate Desired Mailing Address

**Home Address**

T \_\_\_\_\_ F \_\_\_\_\_ E-Mail \_\_\_\_\_

**Employer** \_\_\_\_\_ Bus. Title \_\_\_\_\_

Bus. Address: \_\_\_\_\_

T \_\_\_\_\_ F \_\_\_\_\_ E-Mail \_\_\_\_\_

**Professional Registration / Memberships Held** Province \_\_\_\_\_

Are you a member of any other Engineering Societies? If so, give details:

SOCIETY	PROVINCE(S)	MEMBERSHIP GRADE
_____	_____	_____

**Academic Record/Work Experience (Please submit C.V. & photocopies of certificates or transcripts)**

TECHNICAL DIVISION MEMBERSHIPS – Select up to three fields in order of preference, (i.e. 1,2,3)

_____ Cold Regions	_____ Eng.Mechanics/ Materials Eng.	_____ Hydrotechnical
_____ Computer Applications	_____ Structural	_____ Transportation
_____ Construction	_____ Environmental	

**Membership Grades**

**Member:** normally holds a recognized educational qualification in Civil Engineering at the level recognized by a provincial Association of Professional Engineers and whose competence has been established by at least four years of professional experience.

**Associate Member:** normally holds an engineering degree from a recognized university but has not yet acquired the qualifications for member status related to the extent of professional practice.

**Professional Affiliate:** technologists, technicians and other persons working in the field of Civil Engineering.

**Graduate Student Member:** those engaged in full time postgraduate studies at a recognized Canadian university may be eligible.

Signature \_\_\_\_\_

Date \_\_\_\_\_