

# AASHTO LRFD Steel Bridge Design Class

*Design of Straight and Curved Steel  
Girder Bridges Using AASHTO  
LRFD Bridge Design Specifications  
(Latest Edition)*

*Including: Gusset Plates, Rating  
Steel Bridges, Global Stability,  
and Cross Frames*

*Approved for 19 Profession Development Hours  
by Florida State and New York State  
Boards of Professional Engineers*

**Miami Beach, Florida  
December 8, 9, and 10, 2011**



Sponsored by Highway Bridge Services  
[www.h-b-s.org](http://www.h-b-s.org)

Technical Program - Day 1 - 8:00 a.m. to 5:00 p.m.

**7:00 a.m. - 8:00 a.m.** Registration

**8:00 a.m. - Noon** Design of Steel Bridges Using AASHTO LRFD Bridge Design Specifications, Dr. Atorod Azizinamini, Ph.D., P.E.

**1:30 p.m. - 5:00 p.m.** Design of Steel Bridges Using AASHTO LRFD Bridge Design Specifications and Cross Frames, Dr. Atorod Azizinamini, Ph.D., P.E.

Technical program - Day 2 - 8:00 a.m. to 4:30 p.m.

**8:00 a.m. - 10:30 a.m.** Design of Steel Bridges Using AASHTO LRFD Bridge Design Specifications, Dr. Atorod Azizinamini, Ph.D., P.E.

**10:30 a.m. - Noon** Gusset Plate Checks and their relation to rating steel bridges, Dr. Atorod Azizinamini, Ph.D., P.E.

**1:30 p.m. - 3:00 p.m.** Fabrication and Construction of Steel Bridges: Fabricator's Perspective

**3:00 p.m. - 4:30 p.m.** Overview of computer program to design I and Box girder steel bridges using AASHTO LRFD provisions. - Dr. Atorod Azizinamini, Ph.D., P.E.

Technical Program - Day 3 - 8:00 a.m. to Noon

**8:00 a.m. - Noon** Design and Construction of Curved Steel Bridges  
Mr. Ken Wright, P.E. , Vice President, HDR, Inc

### **HOTEL RESERVATION AND INFORMATION**

The workshop will be held at the Four Points by Sheraton, located at 4343 Collins Ave, Miami Beach Florida, 33140. Located directly behind the hotel is Miami Beach, voted as one of the top 10 swimming beaches in the world. For reservations call 305-531-7494. Many other hotels are nearby and within walking distance, including Holiday Inn Miami Beach (305-532-3311) and Days Inn Oceanside (305-673-1513).



### **COURSE MATERIALS**

Attendees will be given a notebook containing a copy of all materials to be presented during the workshop.

### **TWO FREE COMPUTER PROGRAMS**

Attendees will be given a CD containing two design software packages. These comprehensive programs are not available commercially and are only provided to those attending the class. The use of these programs will be demonstrated in the class.

**HBS-STEEL-LRFD**, a computer program capable of analyzing and designing both I and box shaped steel girder bridges using AASHTO LRFD Bridge Design Specification.

**HBS-GUSSET-LRFR**, a computer program capable of assessing the safety of gusset plates and evaluating their effect on rating of steel bridges using concurrent forces with minimal input.

**NO LUNCH WILL BE PROVIDED.**

**ATTENDEES ARE RESPONSIBLE FOR THEIR OWN MEALS**

## BRIEF DESCRIPTION OF MAJOR TECHNICAL TOPICS

### **Design of straight steel girder bridges using latest edition of AASHTO LRFD Steel Bridge Design Specifications**

**by Dr. Atorod Azizinamini, Ph.D., P.E.**

1 - Brief background on Probability and Reliability aspect of AASHTO LRFD code, 2 - Load models for various limit states, 3 - Distribution factors for various load conditions and limit states, 4 - Overview of the major changes to design provisions for steel bridges, 5 - Defining compact, non-compact and slender sections, 6 - Constructability limit state, 7 - Service limit state, 8 - Fatigue and fracture limit state, 9 - Strength limit state, 10 - Design provisions for positive section, 11 - Design provisions for negative section and use of Appendix A, 12 - Design for shear and combined shear and bending, 13 - Tips for economical ways of using high performance steel in I-girder and box steel bridge designs, 14 - Gusset Plate Check and rating steel bridges, 15 - Family of new modular steel bridge systems suitable for accelerated bridge construction, 16 - Steel bridges behaving simple for dead load and continuous for live loads, 17 - Design of continuous steel bridge system, 18 - Cross frames and their role in steel bridges, including strength and stiffness provisions, 19 - Overview and use of HBS-STEEL-LRFD and HBS-GUSSET-LRFR computer program.

### **Design, Fabrication and Construction of Curved Girder Steel Bridges**

**by Mr. Ken Wright, P.E., HDR Inc.**

1 - Introduction, 2 - History of curved girder bridge design and research in the U. S., 3 - Analysis of curved girder bridges, including V-Load and refined methods of analysis, 4 - Available commercial software for analysis, 5 - Accommodation of thermal movements, 6 - AASHTO guide specification Load Factor Design provisions, 7 - Load combinations and centrifugal force, 8 - Guidelines and tips for initial layout and design, 9 - Fabrication procedures including cut curving and heat curving, 10 - Shipping considerations, 11 - Lifting of I-girder sections, 12 - Erection sequencing, 13 - Use of oversized holes at cross-frame connections, 14 - Complete case history covering the construction of a large curved girder bridge that had deflection issues during construction, 15 - Latest Research results and upcoming AASHTO codes covering design of curved girder bridge

## ABOUT THE INSTRUCTORS:

**Dr. Atorod Azizinamini, P.E.** is Professor and Chair, Civil and Environmental Engineering Department at Florida International University. He was Formerly Distinguished College of Engineering Professor with University of Nebraska-Lincoln. He has developed several innovative steel bridge systems, including folded plate technology and simple for dead and continuous for live load steel bridge systems. He is currently leading several major research studies, including development of Guide for Bridges for Service Life, a first document worldwide devoted to service life of various bridge systems. He has also assisted DOTs in design and construction of innovative steel bridge systems. Dr. Azizinamini is a member of several national committees related to steel bridges. He has more than 200 technical publications in the structural engineering field and is nationally and internationally recognized for his expertise in steel bridge area. He has taught more than 40 short courses to design professionals on design of steel bridges

**Mr. Ken Wright, P.E.** is a Senior Vice President and Senior Professional Associate with HDR Engineering, Inc. and is the Transportation Business Group Manager for HDR in West Virginia / Pennsylvania / Ohio. He has a wide variety of bridge design experience, including grade separation structures, complex urban interchanges and major structures, including several river bridges and various transit structures. He has been involved in the design of many curved girder bridges, some with spans in excess of 240'. He has been employed by HDR for 29 years since graduating from Lehigh University in 1982 with a BS in Civil Engineering. He also completed a Masters in Business Administration in 2007.

## PROFESSIONAL DEVELOPMENT HOURS

Attendees will receive a certificate stating that they have completed 19 hours of continuing education classes. This course is also approved for 19 hours of Professional Development Hours by the Florida State and New York State Boards of Professional Engineers. Application is submitted to New Jersey Board of Professional Engineers and it is pending.

# Registration Form

Please complete the form at right  
(one for each attendee)  
and fax it to (402-858-6323) or mail to the  
address below.

Highway Bridge Services  
UN-Technology Park  
4701 Innovation Drive, Suite 106  
Lincoln, NE 68521

If you do not receive a confirmation e-mail  
within one week:  
Please call 402-858-6414

The workshop will be limited to 60 attendees,  
first come first served

## Cancellation Policy

Written notice must be received two weeks  
prior to the workshop to cancel registration.

Not applicable to registrations received  
within two weeks of the class.

Visit [www.h-b-s.org](http://www.h-b-s.org) for more information

First Name: \_\_\_\_\_ Last Name: \_\_\_\_\_

Employer: \_\_\_\_\_ Title: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip Code: \_\_\_\_\_

Daytime Phone: \_\_\_\_\_ Cell Phone (optional): \_\_\_\_\_

Email: \_\_\_\_\_

<b>Registration Fees:</b>	Up to Two weeks before the workshop	Within two weeks of workshop	Enclosed
General Registration	\$1250	\$1350	_____
Second employee from same organization	\$1050	\$1150	_____
Third+ employees from same organization	\$875	\$975	_____
DOT or Government Employees	\$875	\$975	_____
		Total	_____

Complete the following information if paying by Credit Card.  
Call 402-858-6414, if you wish to give your credit card number by phone.

Visa      Number \_\_\_\_\_

MasterCard      Exp. Date \_\_\_\_\_

Name as it appears on card: \_\_\_\_\_

Signature \_\_\_\_\_