

# IOWA STATE UNIVERSITY

Civil and Construction Engineering  
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January 23, 2008

To: State Bridge Engineers  
County Engineers  
Public Works Directors  
Consulting Engineers

From: Jim Cable P. E.

Subject: NHI Bridge Inspection and Maintenance Course Opportunities

The Iowa DOT and ISU/CCEE are scheduling a series of bridge related NHI courses that will **begin in mid February and end in Mid July, 2008. Each is scheduled to be taught in Iowa only once in 2008 and only if sufficient numbers of students (20) can be found for each course.** The courses are the following:

1. ***Bridge Inspection Refresher Training*** (NHI#130053, 3 days), February 19-21, 2008 – Check the date you passed the two week course in bridge inspection. If it is currently greater than five years ago or will be five years in 2008, you should plan to attend this course to remain certified.
2. ***Countermeasure Design for Bridge Scour and Stream Instability*** (NHI#135048, 2.5 days), March 11-13, 2008 - This especially designed to meet the needs of County Engineers and Consulting Engineers who are involved in the design and construction of scour countermeasures and comes from requests by County Engineers in Iowa.
3. ***Fracture Critical Inspection Techniques for Steel Bridges*** (NHI#130078, 3.5 days), July 15-18, 2008 – City and County Engineers and Consulting Engineers in design, maintenance and operations are encouraged to attend this one.

Note: We are still trying to obtain Instructional support for the following courses and will be providing more information when available. Our intent is to have them taught in the spring of 2008, but NHI is booked through July 2008 at this time.

1. Engineering Concepts for Bridge Inspectors (NHI#130054, 5 days)
2. Safety Inspection of In-Service Bridge (NHI#130055, 10 days)

Registration details for each of the courses is shown below. If you have questions, contact Jim Cable directly at 515-292-5042 or [jkable@iastate.edu](mailto:jkable@iastate.edu)

## **COURSE NUMBER 130053: Bridge Inspection Refresher Training**

### **Course Duration**

3 days

### **Course Dates/Times/Location:**

February 19-21, 2008, Country Inn and Suites, 2605 SE 16<sup>th</sup> Street, Ames, Iowa  
8:00 a.m. - 5:00 p.m. each day

### **Intended Audience**

State, county, city, consultants, federal, technicians, inspectors and engineers employed in inspecting bridges or managing bridge inspection programs. Participants must have completed prior comprehensive bridge inspection training, or meet the criteria for a bridge inspector under the State's procedures or requirements. In Iowa these persons are required to take this course once every five years after completion of the comprehensive (2 week) course to retain their certification.

### **Course Fee**

\$600 per person. The cost includes the course materials, continental breakfast, lunch and coffee break refreshments for each class day.

### **Class Size**

Limited to 30 persons.

### **Course Description and Purpose**

The major goals of this course are to refresh the skills of practicing bridge inspectors in fundamental visual inspection techniques; review the background knowledge necessary to understand how bridges function; communicate issues of national significance relative to the nations' bridge infrastructures; re-establish proper condition and appraisal rating practices; and review the professional obligations of bridge inspectors. Core topics include tri-axial constraint, inspector qualifications and duties, record keeping and documentation, structure inventory and appraisal overview, National Bridge Inventory (NBI) standard component ratings, element level ratings, safety, component case studies for decks, superstructures, substructures and channels, and a virtual bridge inspection classroom exercise.

### **Course Objectives**

Upon completion of the course, participants will be able to:

1. Identify and document inspection observations using standard methods
2. Evaluate defects based on current AASHTO Manual for Condition Evaluation of Bridges
3. Code NBI bridge components using FHWA Recording and Coding Guide
4. Code element level bridge data in accordance with the AASHTO Guide for CoRe (Commonly Recognized) Structural Elements.

## **COURSE NUMBER 135048: Design for Bridge Scour and Stream Instability**

### **Course Duration**

2.5 days

### **Course Dates/Times/Location – Will be offered twice**

March 11-13, 2008, Country Inn and Suites, 2605 SE 16<sup>th</sup> Street, Ames, Iowa  
8:00 a.m. - 5:00 p.m. each day

### **Intended Audience**

Federal, state, and local highway hydraulic, structural, and geotechnical engineers and bridge inspectors responsible for maintaining the integrity of highway bridges against possible hydraulic-related problems. **This course is being offered in response to questions from County Engineers and they are encouraged to attend.** Consultants who do bridge engineering work are encouraged to attend.

### **Course Fee**

\$530 per person. The fee includes course materials, continental breakfast, lunches and refreshment breaks for each of the 10 days of class. It will also include travel to and from the field exercise bridge sites.

### **Class Size**

Limited to 30 persons

### **Course Description and Purpose**

This course provides an overview of countermeasures to highway related failures from effects of stream instability, scour, erosion, and stream aggradation and degradation problems. Material for the course comes primarily from Hydraulic Engineering Circular (HEC) “Bridge Scour and Stream Instability Countermeasures- Experience, Selection, and Design Guidance” (HEC-23).

Given a stream instability and scour problem, participants will select appropriate countermeasures to correct the problem. The course provides training in recommended strategies for developing a plan that includes appropriate countermeasures, including alternatives to conventional riprap and filter design.

Participants will apply hydraulics analysis techniques to countermeasure design for seven design guideline workshops. The course provides an introduction to fixed and portable instrumentation for scour monitoring using audiovisual demonstrations. Participants will receive training in designing a monitoring program to reduce the risk from scour.

### **Course Objectives**

Upon completion of the course, the participants will be able to:

1. Develop a plan of action for a scour critical bridge.
2. Propose countermeasures for stream instability and scour problems.
3. Identify countermeasures for bridge scour and stream instability using the HEC-23 countermeasures matrix.
4. Design selected countermeasures with HEC-23 design guidelines.

## **COURSE NUMBER 130078: Fracture Critical Inspection Techniques for Steel Bridges**

### **Course Duration**

3.5days

### **Course Dates/Times/Location – Will be offered twice**

July 15-18, 2008, Country Inn & Suites, 2605 SE 16<sup>th</sup> Street, Ames, Iowa

8:00 a.m. - 5:00 p.m. each day

### **Intended Audience**

This course is especially designed for public and private-sector bridge inspectors, supervisors, project engineers, maintenance engineers, shop inspectors, shop foreman, and others responsible for shop fabrication and field inspection of fracture critical steel bridge members. *Consulting engineers involved in the design, construction and inspection of bridges in Iowa are especially urged to attend this course.* Participants should have completed NHI courses #130054 Engineering Concepts for Bridge Inspectors and /or # 130055 Safety Inspection of In-Service Bridges, or possess equivalent field experience relative to bridges to fully understand bridge mechanics and bridge safety inspection procedures as required by the National Bridge Inspection Standards.

### **Course Fee**

\$675 per person. The fee includes course materials, continental breakfast, lunches and refreshment breaks for each day of class.

### **Class Size**

Limited to 30 persons

### **Course Description and Purpose**

The course curriculum reflects current practices and addresses new and emerging technologies available to bridge inspectors. In addition, the course includes exemplary training and hands-on workshops for popular types of nondestructive testing (NDT) equipment and a case study for the preparation of an inspection plan for fracture critical bridge.

The first day focuses on the concept of fracture critical members (FCMs), FCM identification, failure mechanics, and fatigue in metal. These fundamentals are followed by an overview of NDT methods. Day two provides demonstration sessions and hands-on applications of NDT techniques for dye penetrant, magnetic particle testing, Eddy current, and ultrasonic testing. Days three and four emphasize inspection procedures and reporting for common FCMs including problematic details, I-girders, floor beams, trusses, box girders, pin and hanger assemblies, arch ties, eyebars, and cross girders/pier caps. A case study of the preparation of an inspection plan of a fracture critical bridge closes out the presentation. This course includes daily participant assignments.

### **Course Objectives**

Upon completion of the course, the participants will be able to:

1. Identify fracture critical bridges, fracture critical bridge members, and fatigue prone details.
2. Categorize contributing factors in the initiation and propagations of fatigue cracks.
3. Perform an intensive, in-depth, and thorough fracture critical member inspection.
4. Identify various crack types and assess their impact on the performance of the member.
5. Evaluate, select and facilitate the use of available NDT methods.
6. Recommend a necessary course of action based on inspection findings.

## GENERAL INFORMATION FOR THE COURSES

### COURSE INSTRUCTORS

Each of the instructors is a professional engineer, with bridge inspection experience, as well as previous training course experience in bridge design and analysis. They are familiar with the National Bridge Inspection Standards as well as the Iowa DOT Bridge Management system and are able to address questions that may arise.

### COMPLETION CERTIFICATE

Each person will receive an FHWA "Certificate of Completion" for each course attended. You will also receive the Iowa State University, "Professional Development Certificate", which Iowa engineers may use to assist them in meeting their licensing requirements. The ISU Civil and Construction Engineering Department Extension staff will retain records of the participants and their grades on the examinations for two years.

### REGISTRATION

Complete attached Registration Form and return it with payment to Registration Clerk, Iowa State University Conference Services, 102 Scheman Building, Ames, IA 50011-1112. You may fax your registration to us at 515-294-6223 if you are paying by Credit Card. **To register, go online at [www.ucs.iastate.edu/bridge/home.html](http://www.ucs.iastate.edu/bridge/home.html)**

If you cancel your registration two weeks before Course start date, your registration fee will be refunded in full. Call Registration Clerk at 515-294-6222 if you need to cancel your registration. No refunds will be made after above dates, if you cannot attend the course, you may send a substitute.

### LODGING INFORMATION:

#### **COURSE NUMBER 130053: Bridge Inspection Refresher Training**

**February 19-21, 2008**

A block of rooms has been reserved at Country Inn & Suites, 26005 SE 16<sup>th</sup> Street, Ames, Iowa 50010. Please make your own reservations by calling 515-233-3935 and mention the course name. Room rates are \$79 plus tax per person. Please make your reservation by February 1, 2008.

#### **COURSE NUMBER 135048: Countermeasure Design for Bridge Scour and Stream Instability**

**March 11-13, 2008**

A block of rooms has been reserved at Country Inn & Suites, 26005 SE 16<sup>th</sup> Street, Ames, Iowa 50010. Please make your own reservations by calling 515-233-3935 and mention the course name. Room rates are \$79 plus tax per person. Please make your reservation by February 15, 2008.

#### **COURSE NUMBER 130078: Fracture Critical Inspection Techniques for Steel Bridges**

**July 15-18, 2008**

A block of rooms has been reserved at Country Inn & Suites, 26005 SE 16<sup>th</sup> Street, Ames, Iowa 50010. Please make your own reservations by calling 515-233-3935 and mention the course name. Room rates are \$79 plus tax per person. Please make your reservation by June 15, 2008.

**FURTHER INFORMATION:** For questions about program content, contact Jim Cable at 515-294-2862. For questions about registration, contact Registration Clerk at 515-294-6222.

**EMERGENCY MESSAGES:** During course hours, messages may be left at 515-294-6222.

*Iowa State University does not discriminate on the basis of race, color, age, religion, national origin, sexual orientation, gender identity, sex, marital status, disability or status as a U.S. veteran. Inquiries can be directed to the Director of Equal Opportunity and Diversity, 3210 Beardshear Hall, Ames, IA 50011 (515) 294-7612*

IOWA STATE UNIVERSITY  
University Extension

# Registration Form

## NHI Bridge Inspection Courses, 2008

<b>Registration Information:*</b>				<input type="checkbox"/> Mr.	<input type="checkbox"/> Ms.	<input type="checkbox"/> Mrs.	<input type="checkbox"/> Dr.	<input type="checkbox"/> Female	<input type="checkbox"/> Male
First Name	MI	Last Name	Suffix						
Job Title				SS # or Other ID #					
Company/Affiliation									
Work Phone			Fax Number			Home Number			
Mailing Address (Your registration confirmation will be sent here)									
City		State		Zip Code		Iowa County			
Email Address							Country		

\* Iowa State University requests this information to preregister you in a conference. No one outside the university, with the exception of participants in this conference, is routinely provided this information. If you fail to provide the required information, we cannot promise accurate registration. (Reference: Iowa Code, Chapter 22.11; Iowa Fair Information Practices Act)

- Registration Fee:** (Check course(s) you will attend)
- \$600 Course Number 130053 Bridge Inspection Refresher Training, February 19-21, 2008**  
The fee includes the course materials, breakfast, lunch and refreshments each day of class. Class size is limited to 30 persons.
  - \$530 Course Number 135048 Countermeasure Design for Bridge Scour & Stream Instability, March 11-13, 2008**  
The fee includes course materials, breakfast, lunch and refreshments each day. Class size is limited to 30 persons
  - \$675 Course Number 130078 Fracture Critical Inspection Techniques for Steel Bridges, July 15-18, 2008**  
The fee includes course materials, breakfast, lunch and refreshments each day. Class size is limited to 30 persons

<p><b>Method of Payment</b></p> <p><input type="checkbox"/> <b>Check (Payable to Iowa State University)</b></p> <p><input type="checkbox"/> <b>Visa</b>    <input type="checkbox"/> <b>MasterCard</b>    <input type="checkbox"/> <b>Discover</b></p> <p>Card Number _____ Exp. Date _____</p> <p>Cardholder Name _____ Signature _____</p> <p><input type="checkbox"/> <b>Purchase Order</b> Purchase Order Number _____</p> <p>Send Invoice to: Name _____</p> <p>Billing Address _____</p> <p>Telephone _____</p>	<p><b>Mail</b></p> <p>Mail form with fee to:</p> <p>Registration Clerk Iowa State University University Conference Services 102 Scheman Building Ames, IA 50011 Fax to (515) 294-6223</p> <hr/> <p style="text-align: center;"><b>OFFICE USE ONLY</b></p> <p style="text-align: center;">IOWA STATE UNIVERSITY University Extension</p>
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