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# Manual Development

**IOWA HIGHWAY RESEARCH BOARD**

**PROJECT NO. TR-646**

1. **BRIDGE INSPECTION**
2. **BRIDGE MAINTENANCE**
3. **BRIDGE RATING**

SIIMS

Structure Inventory and Inspection Management System

- SIIMS home
- Contacts
- FAQs
- Forms
- InspectTech Collector
- Resources and information
- Training information

## Structure Inventory and Inspection Management System

The Iowa Department of Transportation's (DOT) Structure Inventory and Inspection Management System (SIIMS) system is the single source location for entering and reviewing condition information on all Iowa bridges, both local and state owned. The system offers a variety of features and capabilities.

SIIMS access

Set-up and troubleshooting version 7.2

### Obtaining System Access:

**Step 1**

Each citizen of Iowa can have an A&A account for any and all applications they need that are hosted on state Web servers.

**All SIIMS users will be required to have a State of Iowa Enterprise A&A account.**

Register for a username and password from the State of Iowa Enterprise A&A Web site.

You will receive a confirmation of your A&A account with information to be used in Step 2.

If you currently have an Enterprise A&A account to access other State of Iowa applications, that username (first.last@iowaid) and password will be used to access SIIMS. Please complete the form(s) found under the forms section that pertain to your role with SIIMS.

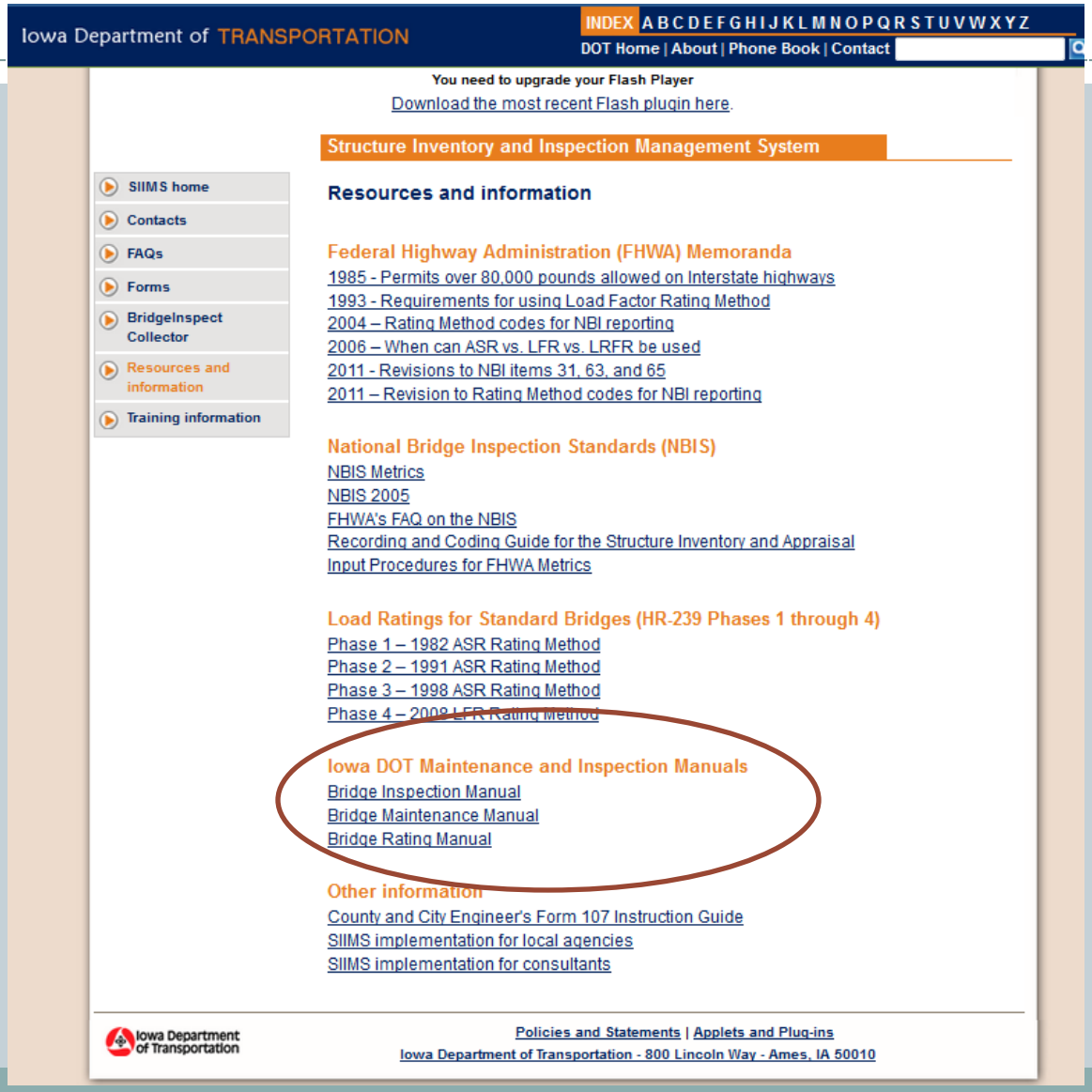
**Step 2**

In addition to the A&A account, you must be registered with SIIMS.

After completing one of the following forms, you will receive a confirmation that your SIIMS account is active before access is available.

//siims.iowadot.gov/

# On-Line Manual Access



# On-Line Manual Access

Iowa Department of TRANSPORTATION

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### Featured bridge

**Streamliner Bridge**

Of the three aesthetic bridge design theme options presented to a group of Algona city officials by the Iowa DOT, the Streamliner Bridge concept was the hands-down favorite. The city already had a strong association with its railroad heritage, and its slogan, "Algona - On the Right Track", capitalizes on rail imagery. More >>

### Contact the Office of Bridges and Structures


800 Lincoln Way
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*Office of Bridges and Structures*

# *Bridge Inspection Manual*

*Issue Date: January 1, 2014*

Developed By:

HDR

PROJECT NO. TR-646 SPONSORED BY THE IOWA HIGHWAY RESEARCH BOARD

# Bridge Inspection Manual

## Disclaimer

**THE BRIDGE INSPECTION MANUAL IS PUBLISHED SOLELY TO PROVIDE INFORMATION AND GUIDANCE TO BRIDGE INSPECTORS WHEN INSPECTING BRIDGES IN THE STATE OF IOWA. THIS MANUAL IS ISSUED TO SECURE, SO FAR AS POSSIBLE, UNIFORMITY OF PRACTICE AND PROCEDURE IN COMPLIANCE WITH THE NATIONAL BRIDGE INSPECTION STANDARDS. THIS MANUAL IS NOT PURPORTED TO BE A COMPLETE GUIDE IN ALL AREAS OF BRIDGE INSPECTION AND IS NOT A SUBSTITUTE FOR ENGINEERING JUDGMENT.**

# Bridge Inspection Manual

- Chapter 1– Regulations, Administration, and Policies
- Chapter 2 – Condition Evaluation of Bridges for Iowa DOT Personnel
- Chapter 3 – Quality Assurance and Quality Control for Iowa DOT Personnel
- Chapter 4 – Condition Evaluation of Bridges for Local Public Agencies
- Chapter 5 - Quality Assurance and Quality Control for Local Public Agencies

https://siims.iowadot.gov

# Chapter 1

- Purpose of the Manual
  - The purpose of this manual is to organize, document, and combine Iowa DOT policies and procedures for bridge inspection practices and post-inspection recommendations so Iowa DOT personnel, local agencies, and consultants will have a readily available resource for their use.
- Definitions, Abbreviations, & Acronyms
- Terminology
  - Figures of bridge types
- History and Requirements of National Bridge Inspection Standards
  - Bridge Organization
  - Inspector Qualifications
  - Bridge Inventory

# Chapter 1 (continued)

- Types of Inspections
  - Initial
  - Routine
  - In-depth
- Iowa DOT Inspection Policies
  - Safety
  - Media Relations
- Statewide Inspection Policies
  - Timelines for completion of inspections and reports
  - Bridge orientation and labeling
  - Critical findings

# Chapter 1 (continued)

- Statewide Inspection Policies (continued)
  - Inspection intervals for non-regulated structures
  - Temporary structures
  - Temporary supports

# Chapter 4

- Inspection Planning
- NBI data items
  - Appraisal ratings
  - Condition ratings
- SIIMS
  - Manager
  - Collector
  - Bridge File
- Field Data Items
  - Deck, Superstructure, Substructure, Channel, and Culvert
  - Bridge data

# Chapter 4 (continued)

- Additional SIIMS documentation
  - Photos, sketches, plans, documents, and files
  - Load rating
  - Critical findings
  - Channel cross sections
  - NBI Sufficiency Rating calculation
  - Supplemental inspection information
- Reporting of Special Items
  - Fatigue-prone details
  - Fracture Critical elements

# Chapter 4 (continued)

- Maintenance, Repair, and Replacement
  - Recommendations
    - Local forces perform repair
    - Contract work needed

# Chapter 5

- Scope of QA/QC Program
- NBIS definition of terms
  - Quality  Control
  - Quality Assurance
- Role of SIIMS
- Quality Control
- Quality Assurance

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# *Bridge Maintenance Manual*

*Issue Date: January 1, 2014*

Developed By:

HDR

PROJECT NO. TR-646 SPONSORED BY THE IOWA HIGHWAY RESEARCH BOARD

# Bridge Maintenance Manual

## Disclaimer

**THE BRIDGE MAINTENANCE MANUAL IS PUBLISHED SOLELY TO PROVIDE INFORMATION AND GUIDANCE TO BRIDGE MAINTENANCE PERSONNEL WHEN REPAIRING BRIDGES IN THE STATE OF IOWA. THIS MANUAL IS ISSUED TO SECURE, SO FAR AS POSSIBLE, UNIFORMITY OF PRACTICE AND PROCEDURE IN METHODS DEVELOPED BY EXPERIENCE. BUDGETARY LIMITATIONS, VOLUMES AND TYPES OF TRAFFIC, LOCAL CONDITIONS AND OTHER FACTORS MAY RENDER COMPLETE COMPLIANCE WITH THE GUIDELINES SET FORTH, IN THIS MANUAL, IMPOSSIBLE OR IMPRACTICAL. THIS MANUAL IS NOT PURPORTED TO BE A COMPLETE GUIDE IN ALL AREAS OF BRIDGE MAINTENANCE AND IS NOT A SUBSTITUTE FOR ENGINEERING JUDGMENT.**

# Bridge Maintenance Manual

- Chapter 1 – Deck Expansion joints
- Chapter 2 – Bridge Decks and Overlays
- Chapter 3 – Bridge Drainage Systems
- Chapter 4 – Bridge Railings
- Chapter 5 – Bridge Bearings
- Chapter 6 – Bridge Superstructures
- Chapter 7 – Bridge Substructures
- Chapter 8 – Bridge Approaches and Approach Slabs
- Chapter 9 – Culverts
- Chapter 10 – Miscellaneous Bridge and Structure Maintenance

# Bridge Maintenance Manual

This manual is for use by any bridge owner.

Chapter structure:

- Types of elements
- Common problems and consequences of poor maintenance
- Basic maintenance and repair procedures

# Bridge Maintenance Manual

- Example section in Chapter 6 – Bridge Superstuctures

**6.2.12 Replace Rotten/Broken Timber Stringers**

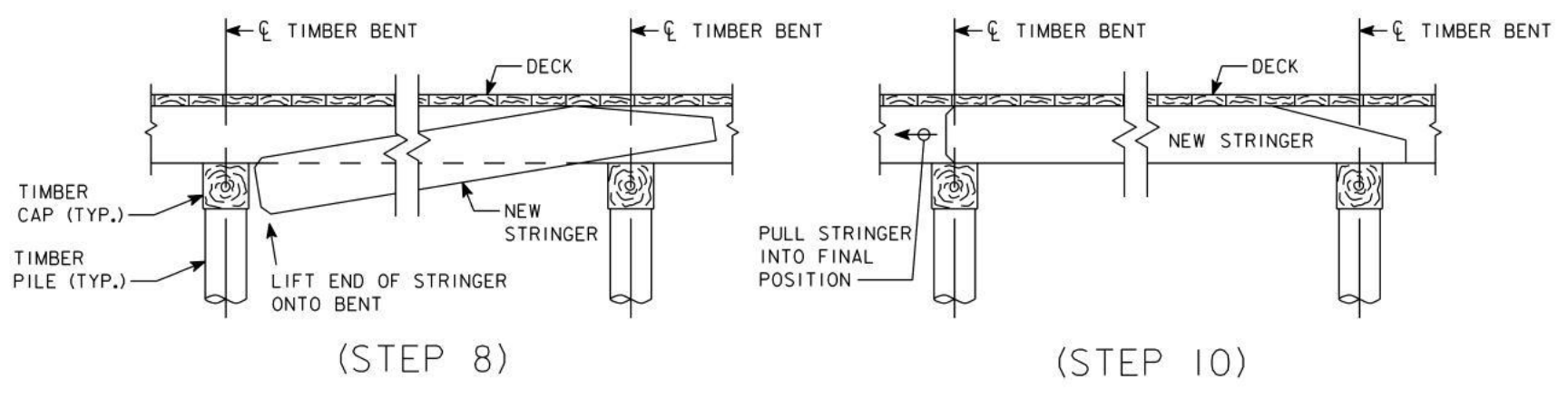
General Considerations: Working from above the deck to replace a damaged stringer will require removal of substantial deck plank members in order to replace the stringer. If possible, work should be conducted from below to minimize deck removal as shown in Figure 6.2.12.

Procedures:

1. Establish traffic control operations on the bridge to stop traffic during stringer replacement activities.
2. Assuming the damaged stringer is left in place, remove blocking or crib bracing between the damaged stringer and adjoining stringers.
3. Place two jacks in adjoining bays to the damaged stringer on each pier cap that supports the damaged stringer. Use steel plates to distribute jack loads to avoid crushing the timber fibers of deck planks.
4. Jack up the deck approximately 0.5 inch to clear the stringer.
5. If the replacement stringer is warped, orient the camber upwards to ensure bearing on all deck members.
6. Cut a wedge approximately 6 inches tall and 2 feet long from the top corner at one end of the new stringer. Cut approximately 45° bevel cuts at the top and bottom corners at the other end of the replacement stringer. Treat cut portions of the timber stringer with wood preservative.
7. Place the end of the stringer with the cut wedge onto one pier cap, and push it far enough onto the cap to allow the other end to be lifted to just clear its cap.
8. Lift the beveled end of the stringer onto its cap.
9. Anchor a come-along to the bent cap under the beveled end of the stringer, and attach the free end of the cable to the wedge-cut end of the stringer.
10. Using the come-along, pull the stringer into final position to provide equal bearing on both pier caps.
11. Drive wedges under each end of the stringer to provide full contact with the deck. Nail wedges in place such that they can be adjusted in the future to account for sag.
12. Install new blocking or crib bracing between the new stringer and adjacent stringers.
13. Remove jacks and spike the deck to the new stringer.

# Bridge Maintenance Manual

## 6.2.12 Replace Rotten/Broken Timber Stringers (continued)



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# *Bridge Rating Manual*

*Issue Date: January 1, 2014*

Developed By:

HDR

PROJECT NO. TR-646 SPONSORED BY THE IOWA HIGHWAY RESEARCH BOARD

# Bridge Rating Manual

## Disclaimer

**THE BRIDGE RATING MANUAL IS PUBLISHED SOLELY TO PROVIDE INFORMATION AND GUIDANCE TO BRIDGE RATING ENGINEERS IN THE STATE OF IOWA. THIS MANUAL IS ISSUED TO SECURE, SO FAR AS POSSIBLE, UNIFORMITY OF PRACTICE AND PROCEDURE IN COMPLIANCE WITH THE NATIONAL BRIDGE INSPECTION STANDARDS AND THE AASHTO MANUAL FOR BRIDGE EVALUATION. THIS MANUAL IS NOT PURPORTED TO BE A COMPLETE GUIDE IN ALL AREAS OF BRIDGE RATING AND IS NOT A SUBSTITUTE FOR ENGINEERING JUDGMENT.**

# Bridge Rating Manual

- Chapter 1 – Introduction
- Chapter 2 – Checking and QA/QC
- Chapter 3 – Load Rating Process
- Chapter 4 – Data Collection
- Chapter 5 – General Requirements
- Chapter 6 – Reinforced Concrete Decks
- Chapter 7 – Timber Decks
- Chapter 8 – Reinforced Concrete Superstructures
- Chapter 9 – Prestressed Concrete Girder Superstructres
- Chapter 10 – Steel Superstructures
- Chapter 11 – Steel Truss Superstructures
- Chapter 12 – Timber Superstructures
- Chapter 13 – Concrete and Masonry Substructures
- Chapter 14 – Steel Substructures
- Chapter 15 – Timber Substructures
- Chapter 16 – Bridge-Sized Concrete Box Culverts
- Chapter 17 – Non-Typical Bridge Types
- Chapter 18 – Posting of Bridges and Posting Considerations
- Chapter 19 – Load Rating Documentation

# Bridge Rating Manual

This manual is written for use by any bridge owner.

Chapter Structure:

- Introduction
- Policies and Guidelines

# Bridge Rating Manual

- **Chapter 12 - Timber Superstructures**

**12.1 INTRODUCTION**

This section pertains to the rating of timber superstructures. All timber bridges shall be rated.

**12.2 POLICIES AND GUIDELINES**

The ASR or LRFR method shall be used for timber bridges built before October 2010 as there is no LFR method for this type of bridge.

The LRFR method shall be used for timber bridges built after October 2010. Refer to the AASHTO LRFD Bridge Design Specifications, Table 8.4.1.1.4-1, for stress limits.

Iowa DOT uses the following:

1. Impact shall not be applied to timber structures per AASHTO.
2. Horizontal shear can often control the ratings and should always be checked.
3. Bending stress can be affected by imperfections in the members and should be accounted for in the rating calculations.
4. Vertical shear does not typically control the rating, but should be checked.

# Questions ?

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