



MINNESOTA DEPARTMENT OF TRANSPORTATION
Engineering Services Division
Technical Memorandum No. 05-02-B-02
July 20, 2005

To: Distribution 57, 612, 618, 650

From: Douglas Differt
Deputy Commissioner/Chief Engineer

Subject: "Critical Deficiencies" found during bridge inspections

Expiration

This is a new Technical Memorandum and will expire July 20, 2010 unless superseded prior to this date.

Implementation

This policy and its instructions are effective immediately.

Introduction

This Technical Memorandum establishes a formal procedure for responding, reporting, and documenting "Critical Deficiencies" found during scheduled bridge inspections.

Purpose

The Federal Highway Administration requires that all states develop a process to monitor critical deficiencies found during bridge inspections. This Technical Memorandum is intended to provide the necessary guidelines to fulfill the FHWA requirements. The guidelines described in this document are based on the "**Critical Deficiency Procedures**" as outlined in Section 1.8.1.4 of the AASHTO Manual for Condition Evaluation of Bridges which states:

Critical structural and safety related deficiencies found during the field inspection and/or evaluation of a bridge should be brought to the attention of the Bridge Owner immediately if a safety hazard is present. Bridge Owners should implement standard procedures for addressing such deficiencies, including:

- Immediate critical deficiency reporting steps
- Emergency notification to police and public
- Rapid evaluation of the deficiencies found
- Rapid implementation of corrective or protective actions
- A tracking system to ensure adequate follow-up actions
- Provisions for identifying other bridges with similar structural details with follow-up inspections

It is recognized nationally that some past bridge failures may have been prevented if prompt attention had been given to concerns noted on bridge inspection reports. To ensure public safety, it is essential that "Critical Deficiencies" not only be brought to the attention of those responsible but that these findings are reviewed to confirm that all necessary corrective actions have been completed.

Guidelines

For the purpose of this Technical Memorandum, the following definitions shall apply.

Critical Deficiency: A "Critical Deficiency" is defined as any condition discovered during a scheduled bridge inspection that threatens public safety and, if not promptly corrected, could result in collapse or partial collapse of a bridge. Critical findings include structural conditions and scour or hydraulic conditions that are found to be critical during the inspection or that are likely to become critical to the stability of the bridge before the next regularly scheduled inspection.

Hazardous Deficiency: A Hazardous Deficiency is defined as an element level condition found during a regularly scheduled bridge inspection that may be hazardous to public safety, but IS NOT expected to lead to collapse or partial collapse of the bridge. While any "Hazardous Deficiency" found during a bridge inspection should immediately reported to the bridge owner (or appropriate authority), the Mn/DOT Bridge Office requires no subsequent documentation.

Bridge: A "bridge" is defined as any bridge, culvert, tunnel, or other structure listed on the Mn/DOT Bridge Inventory.

Bridge Inspection: A "bridge inspection" includes any routine inspection, special inspection, hands-on Fracture Critical inspection, or underwater inspection performed on a bridge.

Bridge Inspector: A "Bridge Inspector" is defined as the inspection team leader which is a certified Level 2, Level N or Level E inspector - this includes inspectors employed by Mn/DOT, Counties, Cities, or by private consultants.

Engineer: The "Engineer" is defined as the supervising registered Professional Engineer of the entity listed on the Mn/DOT Bridge Inventory as having "report jurisdiction" for the bridge. In most cases, this will be the Mn/DOT District Bridge Engineer, the County Engineer, or the City Engineer.

Bridge Owner: The "Bridge Owner" is defined as the entity listed on the Mn/DOT Bridge Inventory as the Owner of the bridge.

Mn/DOT Bridge Inspections Engineer: The "Mn/DOT Bridge Inspection Engineer" refers to the State Bridge Inspection Engineer who is the primary statewide contact for reporting Critical Bridge Deficiencies.

Mn/DOT Bridge Inspection Engineer
3485 Hadley Ave. North
Oakdale, MN 55128
(651) 747-2132

Critical Deficiency Process: The following guidelines outline and describe the procedures to be followed if a Critical Deficiency is observed during a bridge inspection. These guidelines are divided into three parts, Responsibilities of the Bridge Inspector, Responsibilities of the Engineer with Reporting Jurisdiction, and Responsibilities of the Mn/DOT Bridge Inspection Engineer.

Part 1 - Responsibilities of the Bridge Inspector: Upon discovery of a "Critical Deficiency"; the Bridge Inspector is responsible for the following:

- 1) **Emergency Bridge Closure:** If the observed condition is severe enough to warrant immediate closure of the bridge (or immediate restriction of traffic above or below the bridge), the Bridge Inspector shall immediately take any actions necessary to ensure public safety.
- 2) **Prompt Notification of the Engineer:** Upon discovery of a Critical Deficiency, the Bridge Inspector shall promptly notify the Engineer. The inspector should identify the bridge number, bridge location, and clearly and accurately describe the critical condition.
- 3) **Inspection Report:** In addition to the prompt verbal notification, the following written documentation must be completed:
 - a) If the Critical Deficiency is observed during a routine (NBI/PONTIS) inspection, the inspector should rate the "Critical Finding Smart Flag" (PONTIS element #964) as "Condition State 2", and briefly describe the critical finding (if necessary, supplemental notes, sketches, photos, and measurements should be included to fully describe the situation) and submit the inspection to the Engineer.
 - b) If the Critical Deficiency is observed during a hands-on Fracture Critical inspection, underwater inspection, or other special inspection, the inspector must submit a brief written statement or report describing the condition (as described in step 2 above) to the Engineer within 48 hours after finding the Critical Deficiency.

Part 2 - Responsibilities of the Engineer: Upon being notified of a Critical Deficiency, the Engineer is responsible for the following...

- 1) **Rapid Evaluation:** The Engineer is required to quickly assess the situation to confirm or refute the finding, and to initiate necessary traffic restrictions to safeguard the public. If in doubt, the Engineer should temporarily close or restrict traffic on the bridge, then contact a consulting bridge engineer, the Mn/DOT Bridge Inspection Engineer, or the Mn/DOT Bridge Office (651) 747-2100 for assistance. If the Engineer determines that the condition reported is not a Critical Deficiency, the "Critical Finding Smart Flag" (PONTIS element #964) can be changed back to "Condition State 1" after discussing with the inspector (the Mn/DOT Bridge Office requires no subsequent documentation).
- 2) **Traffic Control & Public Notification:** The Engineer shall be responsible for coordinating all necessary traffic control (such as load restrictions, lane or bridge closures, or detours). The Engineer shall also be responsible for the public notification of any traffic restrictions.
- 3) **Immediate Notification of the Bridge Owner:** If the bridge owner (as listed on the Mn/DOT Inventory) is different than the entity with "report jurisdiction", the Engineer shall be responsible for informing the Bridge Owner that a Critical Deficiency has been found.

- 4) **Submittal of Inspection Report to the Mn/DOT Bridge Inspection Engineer:** Within 7 days after a Critical Deficiency has been reported, the Engineer must notify Mn/DOT's Bridge Inspections Engineer of the finding and must submit a copy of the inspection report.
- 5) **Rapid Implementation of Corrective Action:** The Engineer is responsible for promptly scheduling repairs to the bridge. If the bridge remains open to traffic, the Engineer is responsible for determining the proper load rating for the bridge, and ensuring that the rating is adequately posted.
- 6) **Resolution of Deficient Status:** After repairs have been completed, the Engineer should change the "Critical Finding Smart Flag" (PONTIS element #964) rating to "Condition State 1", and add a brief description of the corrective actions taken in the inspection notes for that smart flag. A copy of the revised inspection report must then be submitted to the Mn/DOT Bridge Inspection Engineer.
- 7) **Updating of the Bridge Inventory:** If the bridge load rating is permanently reduced, the Engineer must submit a new load rating to the Mn/DOT Bridge Inspection Engineer. If the bridge is closed to traffic, the Engineer must notify the Mn/DOT Bridge Inspection Engineer.

Part 3 - Responsibilities of the Mn/DOT Bridge Office:

- 1) **Provide Immediate Assistance:** Requests for assistance in evaluating a Critical Deficiency should be directed to the Mn/DOT Bridge Inspection Engineer (or, if not available, to other available resources within the Mn/DOT Bridge Office) - such requests will be given priority over other work. If a Critical Deficiency is confirmed, a brief written report should be filed with the Mn/DOT Bridge Inspections Engineer. Requests for assistance with follow-up inspections should be directed to the Mn/DOT Bridge Office Bridge Inspection Unit. Requests for repair recommendations should be directed to the Mn/DOT Regional Bridge Construction Engineer (651) 747-2100.
- 2) **Recording the Critical Finding:** Upon receipt of a written or oral report or the Bridge Inspection Report describing the Critical Deficiency from the Engineer, the Mn/DOT Bridge Inspection Engineer will enter the bridge number and date of the inspection in a Critical Deficiency Log, will create a separate file for the bridge to track resolution of the problem, and will require the critical finding to be entered promptly into the PONTIS Bridge Management System. The Critical Deficiency Log will be available upon request.
- 3) **Follow-up:** The Mn/DOT Bridge Inspection Engineer shall monitor the situation as necessary until the situation has been resolved and written notification of corrective action has been received. If notification is not received within 30 days, the Bridge Inspections Engineer shall contact the Engineer (or Bridge Owner) for further information.

- 4) **Documenting the Resolution of the Deficiency:** After the notification of corrective action has been received from the Engineer, the Mn/DOT Bridge Inspection Engineer shall enter the date of resolution in the Critical Finding Log and shall file all related documents.
- 5) **Updating of the Bridge Inventory:** Upon notification that a bridge has been closed, or that a bridge load rating has been permanently reduced, or that repairs have been completed, the Mn/DOT Bridge Inspection Engineer will forward the information to the Bridge Management Unit so the bridge inventory can be properly updated.
- 6) **Annual Reporting of Critical Bridge Deficiency Status:** Prior to May 1st of each year (which coincides with the annual submittal of the bridge inspection data to the FWHA), the Mn/DOT Bridge Inspections Engineer will report the status of Critical Bridge Deficiencies to the State Bridge Engineer. The status of Critical Deficiencies that have been logged during the past year, and any additional bridges in the PONTIS database with Element #964 in Condition State 2 will be included in the report.

Questions

Any questions regarding this Technical Memorandum should be directed to **Todd Niemann, Mn/DOT Bridge Inspection Engineer, 3485 Hadley Ave. North, Oakdale, MN 55128, (651) 747-2132**. Any questions regarding the publication and distribution of this Technical Memorandum should be referred to Benjamin Christensen, Design Standards Unit at (651) 284-3447, or Mohammad Dehdashti, Design Standards Engineer at (651) 296-4859. All active Memoranda and a list of historical Technical Memoranda can be viewed at <http://www.dot.state.mn.us/tecsup/tmemo/index.html>