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## 1.7 CRITICAL FINDING PROCEDURE AND DOCUMENTATION

### 1.7.1 Critical Finding

A critical finding (CF) is a structural or safety related deficiency that requires immediate action to ensure public safety. Furthermore, a CF is a deficiency found on a bridge or portion thereof, discovered either by bridge inspection or notification by the public, which critically threatens the structural stability of the bridge and/or the public safety, and is of such severity that requires immediate follow-up action. Deficiencies such as damage, corrosion, section loss, settlement, cracking, deflection, delamination, loss of bearing, or any condition that threatens the integrity of primary structural element(s) or poses an imminent threat to public safety are considered a CF. Critical finding must be resolved as soon as possible but no later than 30 days of the finding.

### 1.7.2 Critical Finding Designation

The criteria for designating a critical finding are listed below. It is a requirement to report any finding or event meeting this criterion as a critical finding.

- Structural conditions or deficiencies that pose an immediate threat to public safety which results in the immediate partial or full closure of the structure.
- An Nonredundant Steel Tension Member (NSTM) inspection condition to be rated in serious or worse condition (Item B.C.14  $\leq$  3).
- Deck, superstructure, substructure, or culvert component to be rated in the critical or worse condition (Items B.C.01, B.C.02, B.C.03, or B.C.04  $\leq$  2, respectively).
- Channel or scour condition to be rated in the critical or worse condition (Item B.C.09 or B.C.11  $\leq$  2, respectively).
- Immediate load restriction or posting, or immediate repair work to a bridge, including shoring, in order to remain open.
  - (1) An immediate posting is when instead of a partial or full closure, the inspector, with consultation with the PM, bridge owner, and possibly the load rating engineer, decides to immediately post the bridge before an official review or rating is completed. An immediate posting is considered a short-term response.
  - (2) An immediate repair is one that requires immediate action to ensure public safety. An immediate repair can also be a full or partial depth hole in the deck, if the inspector determines a partial closure is required until the repair is complete.

Potential events/incidents which may lead to a critical finding designation are as follows:

- Structural deficiency of primary structural element(s) which threatens the overall integrity of the structure (Bridge closed ASAP; this may require bridge replacement or major rehabilitation)
- Structural deficiency of primary structural element(s) that requires a partial lane and or shoulder closures for an extended duration (Partial closure ASAP; partial closure shall remain until repairs, rehabilitation, or replacement can occur).
- Component condition requires the immediate load restriction or posting (Load posting signs shall be installed no later than 30-days after the owner is notified – Owner is responsible to have Load Posting Verification Activity completed).
- Other Safety deficiencies (Movement, Natural Disaster, Bridge Hits, etc.)
- Scour around a substructure unit that could conceivably cause the failure of the structure.
- Structural review meeting the criteria above.
- Non-destructive evaluation meeting the criteria above.



### 1.7.3 Critical Finding Procedure

#### 1.7.3.1 Immediate Action:

Upon identification of a critical finding, the inspection team leader (TL) will immediately assess the safety of the bridge and impact to the public. The TL may decide to close all or a portion of the bridge until further analysis can be performed. The immediate actions taken by the inspector may vary with the circumstance. The TL may require remedial work be performed or a load posting installed immediately depending on the seriousness of the finding. A critical finding actions must be resolved as soon as possible, typically in less than 30 days. This does not necessarily mean the deficiency has been corrected. It means an action has been taken to address any immediate safety concern.

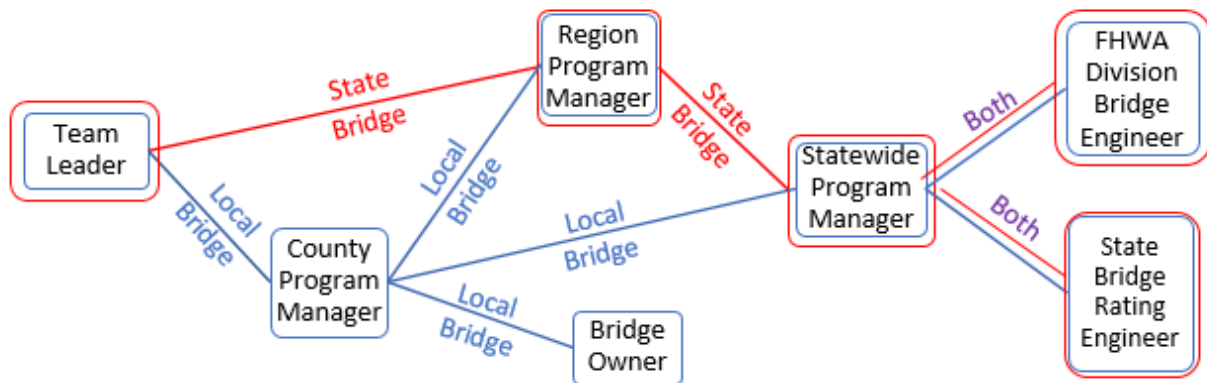
If the action is a load posting or change of an existing load posting, the signage must be installed as soon as possible, but no later than 30 days after the determination of the need for the posting.

#### 1.7.3.2 Critical Finding Notification

##### 1.7.3.2.1 Notification Process

Once the immediate safety concern has been addressed, the TL will notify the County (CPM) or Region Program Manager (RPM) with jurisdiction over the bridge, who will notify the WisDOT Statewide Program Manager (SPM). The CPM will notify the owner of the structure and the RPM. The SPM will notify the FHWA Division Bridge Engineer and the State Bridge Rating Engineer. Direct communications through telephone notification and a follow-up email is required to properly document discussions.

Notification Tree:



During the notification process, the inspector, PM, owner, and others will discuss a plan of action, including any actions to be taken (temporary, underway, and planned), and a communication plan going forward.

Contact information for program managers can be found on the WisDOT inspection website located here at this link [Designated Inspection Program Managers](#).



Notifications should be documented in HSIS on the Critical Findings tab. The PM with jurisdiction over the bridge and others involved with the Wisconsin bridge inspection program are auto populated with email address that will be automatically sent when comments are added and the “send” button is clicked. Creating a notification in HSIS does not fulfill the primary communications requirement of the Critical Findings process – a telephone call is required.

### 1.7.3.2.2 FHWA Notification

National Highway System (NHS) – The Statewide Program Manager will notify the FHWA Division Bridge Engineer within 24 hours of discovery of any critical finding on the NHS identified as the following:

- Structural conditions or deficiencies that pose an immediate threat to public safety which results in the immediate partial or full closure of the structure.
- NSTM inspection condition to be rated in serious or worse condition (Item B.C.14  $\leq$  3).

Monthly Status Report - FHWA Division Bridge Engineer will receive from WisDOT a monthly, or as requested, a written status report for each critical finding until resolved. A critical finding should be resolved within 30 days so it should not appear on more than 2 monthly reporting intervals. The report will contain:

1. Owner
2. NBI Structure Number
3. Date of Finding
4. Description and Photos of critical finding (referenced and available on HSIS under the inspection and critical finding activity)
5. Description of completed, temporary, and or planned corrective actions to address critical finding (referenced and available on HSIS under the inspection and critical finding activity)
6. Status of corrective action (Active/Completed)
7. Estimated date of completion if corrective actions are active
8. Date of completion if corrective actions are completed

### 1.7.3.3 Additional Actions

Additional action may need to be taken beyond addressing the safety concern. The PM and the owner must determine the next actions. This would include monitoring any temporary measures, updating/improving traffic control measures, completing permanent repairs, planning for rehabilitation or replacement, and other. Temporary repairs and traffic control must be monitored for worsening or changing condition and proper function. Temporary repair is not an acceptable substitute for permanent repairs. Actions take must be recorded in HSIS on the Critical Findings tab.

### 1.7.3.4 Analysis and Design

The determination of a critical finding may require structural calculations to determine load-carrying capacity or an engineered repair to mitigate the structural deficiency. Although the State Bridge Rating Engineer is part of the notification process, each County Inspection Program (for local structures) is responsible to independently perform any necessary load ratings or repair designs (stamped by a WI licensed PE). The State Bridge Rating Engineer is available for consultation and oversight to the counties. For critical findings on state



structures, Bureau of Structures will perform, or have performed, any necessary load ratings and repair designs.

The determination of a critical finding may require structural calculations be performed to determine load-carrying capacity or an engineered repair be designed to mitigate the structural deficiency. Although the State Bridge Rating Engineer is part of the notification process, each County Inspection Program (for local structures) is still responsible to independently perform any necessary load ratings or repair designs. Bureau of Structures will then serve as oversight to the counties. For critical findings on state structures, Bureau of Structures will perform, or have performed, any necessary load ratings and repair designs.

### 1.7.3.5 Close-out Inspection

A routine or special inspection must be completed to update the condition and inventory data after the final actions. Bridges that remain closed or restricted until a rehabilitation or replacement project is completed will also require a close-out inspection. Document and photograph the traffic control and bridge closure system installed. Permanent traffic control measures, including barriers when required, must be in place. Include assessment 9036 Bridge Closure System. The anticipated timeframe of the rehabilitation or replacement must be documented on the inspection report and the critical findings tab. The close-out inspection information can be documented in the same inspection report the CF was identified or in a separate special inspection report.

### **1.7.4 Critical Finding Documentation**

The critical finding must be documented in the Highway Structures Information System (HSIS) using the Critical Finding Activity Type under the Inspection Tab as soon as practicable, but within 30 days of the finding. Form [DT2026](#) was developed to assist the inspector in documenting the critical information and plan of action. This document can be used to help complete the Critical Findings tab in HSIS. The completed DT2026 can be uploaded, but is not required, into HSIS as supporting documentation. The information needed includes the following:

- Date of Critical Finding
- Description of the critical finding - include a detailed narrative of exact location, size, and severity of all structural deficiencies that warrant a critical findings designation. Provide additional information on how the critical finding was discovered and the reason the deficiency exists (mainly for bridge hits).
- Any actions undertaken to resolve the critical finding (temporary, underway, planned, immediate final, and long-term final
- Repair plans, design/load rating calculations.
- Action completion dates; estimated completion dates
- Notifications and contacts completed
- Photographs and/or sketches of the structural deficiencies
- Photographs of the installed traffic control/restrictions

Create an inspection (Special, Routine, NSTM, or UW-Dive) report in HSIS with a Critical Finding Activity within 30 days of the CF. Create only one Critical Finding Activity for the same



event regardless of any additional inspection reports. Upload photos and any inspection documentation in an open inspection. Continue to update the Critical Finding tab with all temporary, underway, planned, and final actions including the completion dates. The Critical Finding tab will remain open until a Final Action is completed and the PM reviews the CF. This inspection report that identified the CF can be completed in HSIS once all information about the inspection has been entered – the CF does not need to be finalized to complete the inspection. However, any photographs or documents related to the critical finding must be included with an inspection report in HSIS. The final immediate action must address the immediate safety concern, including installation of the proper traffic control and needed barrier.

### Critical Finding Action Definitions

- Temporary – This action is selected to describe a temporary action taken to secure the scene. Examples include restricting traffic using temporarily traffic barrels, a temporary repair, or blocking a lane with a vehicle while trying to determine the next action.
- Underway – This action is selected to describe any actions that are in the process of being completed. An example would be repair work that has started and is in progress. This action would typically be selected when the repair will take multiple days, weeks, or longer to complete.
- Planned – This action is selected to describe any expected future actions that are not the Final-Immediate. Examples would be additional inspections, reduced inspection interval, or repairs being planned/designed. If bridge rehabilitation or replacement is the final planned action, the anticipated timeframe must be documented as a Final-Long Term Action.
- Final-Immediate – This action is selected when the action has resolved the safety concern, the traffic restriction or bridge closure is in place, the posting signage is installed, and/or the permanent repair has been completed. A close-out inspection is required to document a final repair.
- Final-Long Term – This action is selected when the final long-term action is a bridge rehabilitation or bridge replacement. A close-out inspection is not required with a final long-term action. An initial or special inspection will be completed once the rehabilitation or replacement is completed.

EXAMPLE CF: A hole is found in a bridge deck in the driving lane. The *temporary action* is to restrict traffic from driving in the area of the hole. An *underway action* would be to place a steel plate over the hole. A *planned action* would be to complete a concrete patch. The *Final-Immediate action* is to complete a permanent concrete patch and remove the traffic restriction. A *Final-Long Term* action may be to put this bridge in the program for rehabilitation. Upon completion of any action, enter a completion date in the Critical Findings tab next to the action completed. If the patch is a permanent repair and no additional actions are needed, a close-out inspection is required.



**CF Action Documentation Review** – Upon the Final-Immediate action being completed and documented, the team leader (TL) will notify the inspection program manager (PM) with jurisdiction over the structure. The PM will review the CF actions documented in HSIS. If the actions are acceptable and complete, the PM must update the complete date on the CF tab in HSIS. . A Final – Long Term action can be added by the PM.

### 1.7.5 Traffic Control

The critical finding may require traffic on the bridge to be restricted. The traffic control and signage for full closures, partial lane closures, or shoulder closures shall be in compliance with the Manual on Uniform Traffic Control Devices (MUTCD) and the Wisconsin MUTCD. These manuals combine to provide guidance on the installation and proper use of traffic control devices. Local municipalities should contact the county highway department for assistance if acceptable barriers or signs are not immediately available. Photographs of the traffic control for the restriction/closure must be included in the CF documentation and loaded into HSIS.

Properly installed traffic control improves the safety of the traveling public and reduces the liability of the bridge owner. Example traffic control layouts for different roadways and situations are shown in the WisDOT Wisconsin Work Zone Field Manual. The layouts shown may need to be modified depending on field conditions and available traffic control devices. Traffic channelizing devices may need to be installed the length of the span for proper delineation. Traffic barriers and channelizing devices that can be easily moved or driven around may result in a non-compliance determination by FHWA’s National Bridge Inspection Program, as well as a risk to the traveling public.

Flow Chart of the Critical Finding Process

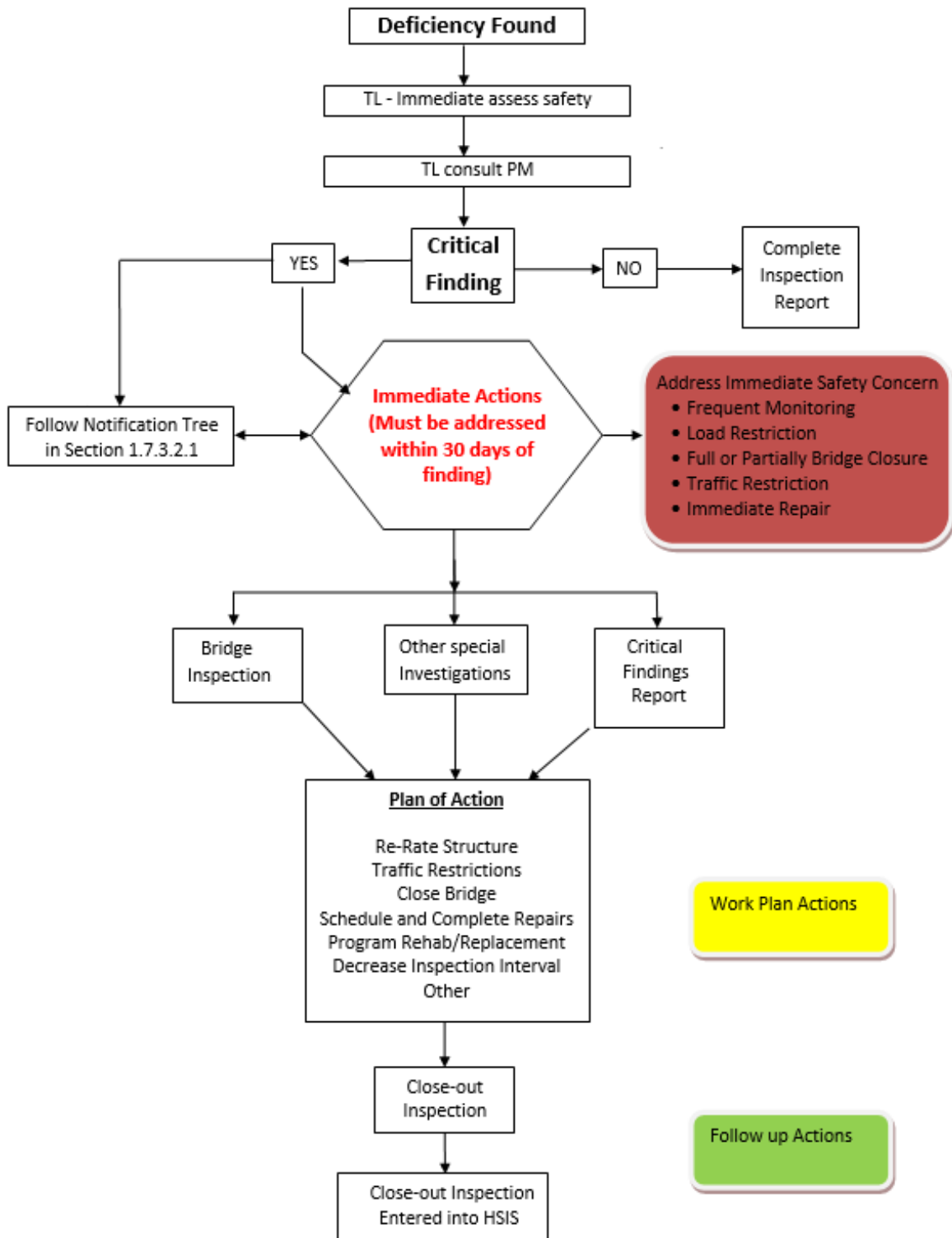


Figure 1.7.1-1: Emergency Notifications and Follow-up Documentation Flow Chart.