Chapter 6 Damage and Repairs

6.01 General

The purpose of this chapter is to provide consistent procedures for reporting bridge repair needs and following up on bridge repair work performed. FHWA has general reporting requirements related to critical findings (discussed later), but otherwise leaves the tracking of repair and maintenance to the owning agency.

Recommendations for repairs arising from bridge inspections range from preventive maintenance that will preserve the life of the structure by slowing down the processes of deterioration, to routine repairs that correct existing minor problems, to critical repairs that must be undertaken immediately to restore service or safeguard the public. The ability to identify and track bridge repair needs and to follow the status of repairs is a vital element of a quality bridge management program. Bridge program managers rely on accurate, timely information provided by concise reports and thorough procedures. The following sections outline both the reports to use and procedures to follow for various types of repair and maintenance needs.

This chapter is specifically written for the use of state forces conducting inspections on both state and locally owned structures. For inspection work performed by state forces on locally-owned structures, it is important for the Local Agency to be aware of the procedures that will be used by the state inspectors. Local Agencies are encouraged to also follow these guidelines but are able to tailor internal procedures to their specific organizational need.

6.02 Critical Damage Bridge Repair Report (CDBRR)

The NBIS (23 CFR 650.313(h))/MBE (Chapter 4) make reference to critical findings/ deficiencies as a special category of repair need requiring immediate attention of the bridge owner with timely notification to FHWA and subsequent tracking of repair status.

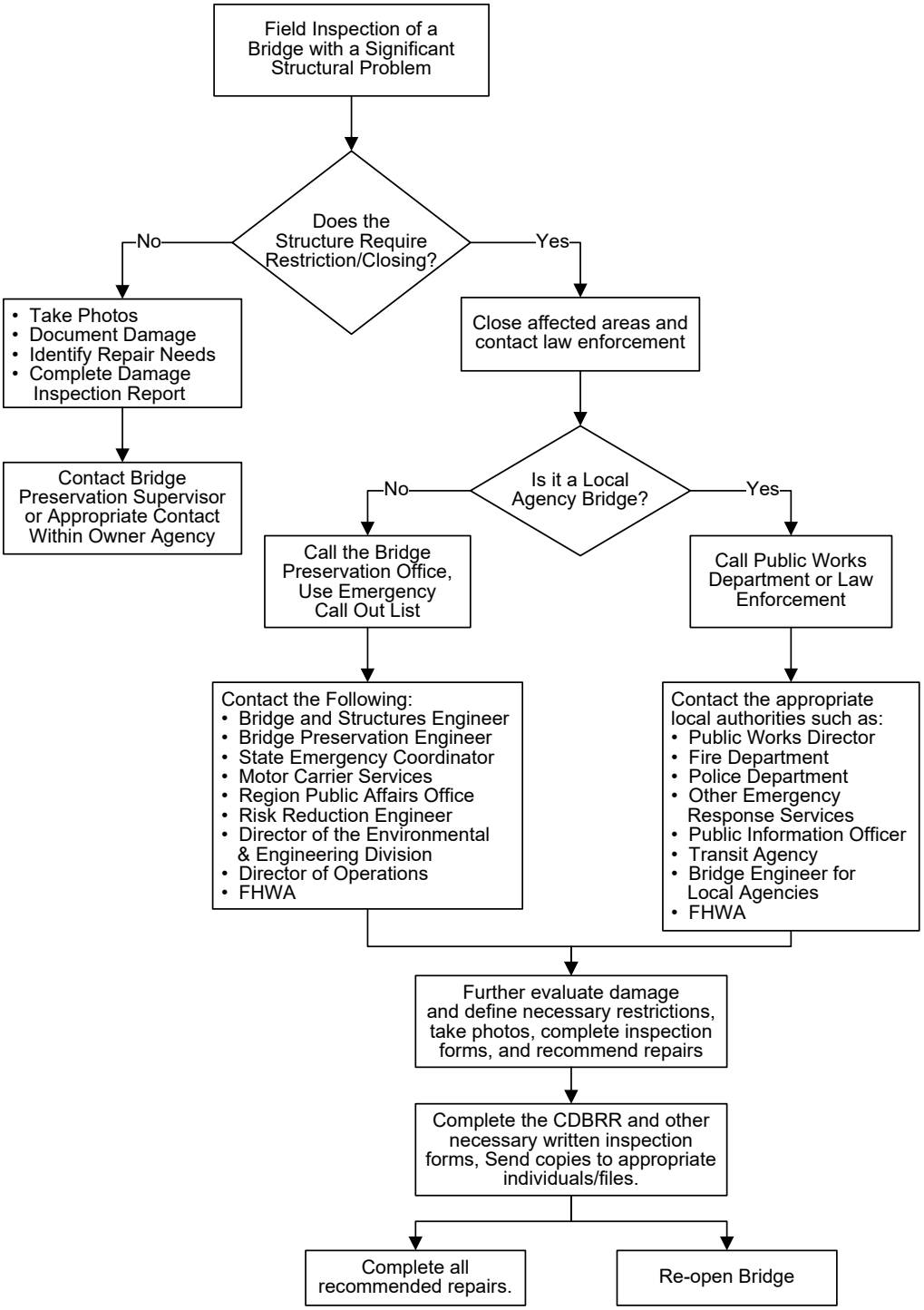
In Washington State, a critical finding is strictly defined as a condition that necessitates closing, posting, or restriction of a bridge or a portion of a bridge due to an identified structural deficiency requiring structural repair(s) before it can be reopened to unrestricted traffic in the original configuration. The restrictions are usually, but not necessarily limited to restrictions to vehicular traffic.

Initial notification (and subsequent status updating) for a critical finding is accomplished by completing and submitting the Critical Damage Bridge Repair Report (CDBRR). The CDBRR form was developed by the state to assist in documenting and tracking critical structural and safety related deficiencies on damaged structures.

FHWA will periodically review the reports and the tracking system to verify the needed repairs were promptly reported and the recommended repairs were completed within a reasonable period of time. FHWA may also conduct field checks to verify that critical repair work was accomplished.

CDBRR incidents can be caused by many factors. Recent examples include scour, fire, structural deterioration, and vehicular impact. There can be other causes (e.g. earthquake or other extreme environmental event). A relatively frequent cause is vehicular impact. A point to be aware of is that a short term closure or restriction of a facility to clean up debris and perform initial inspections does not qualify as a CDBRR incident by itself.

See Figure 6.02-A for guidance on determining when a CDBRR is required.



Field Inspection Procedure
Figure 6.02-A

The Bridge Preservation Engineer (for State bridges) or the WSDOT Local Programs Bridge Engineer (for Local Agency bridges) is to be notified by phone or email within one working day of identifying structural deficiencies to a structure that will likely require a CDBRR.

The CDBRR must be filled in as completely as possible immediately after the post-incident inspection. See Section 6.02.B for CDBRR submittal requirements.

CDBRR incidents are to be registered in the systemwide database by completing a Damage Inspection Report (DIR) within BridgeWorks (BW). The DIR is discussed further in Chapter 3. The CDBRR and all supporting materials (photos, sketches, etc.) are completed and attached to the Files Tab in BW. All repair recommendations arising from the CDBRR incident are to be identified in the CDBRR and also entered as specific repairs in BW. The specific repairs in BW shall be tagged as "CDBRR" within the repair description.

Any time the recommended repairs cannot be accomplished immediately, the applicable NBI and BMS condition codes should be updated to ensure that the data accurately reflects the bridge's current condition and status.

The following procedure describes how to fill out the CDBRR.

A. Completing the CDBRR

A dynamic CDBRR form (developed using InfoPath) may be copied from:

W:\Data\Bridge\BridgeDamage\CDBRR Form (For Inspectors Use). See Section 6.06 for a copy of the CDBRR form.

When filling out the CDBRR form, team leaders shall check the appropriate boxes in the upper right corner of the form. Check the CDBRR box when initially creating the form. The Update box should be checked and remain checked for all subsequent changes to the originally submitted CDBRR.

After the CDBRR type has been selected, the team leader may now fill in the applicable fields of the form. The form is organized into three distinct sections:

1. the bridge and inspection team information,
2. the description of the incident that caused the damage,
3. the follow-up or post repair activities on the structure.

Team leaders should fill out the form as thoroughly as possible although some information may be unknown and left blank.

1. **Bridge and Inspection Team Information** – This portion of the CDBRR briefly describes the basic information of the structure that has been damaged along with the inspection team information. The items within this section of the CDBRR are described below.
   - **Agency Name** – The name of the owner agency of the damaged structure.
   - **Structure ID** – The unique federal structure identification number associated with the particular structure in the NBI assigned by WSDOT.

- **Bridge Number** – The bridge number given by the owner agency that is associated with the particular structure.
- **Milepost** – The structure's milepost location on the inventory route.
- **Incident Date** – The date of the incident that caused damage to the structure, if the information is available.
- **Bridge Name** – The name given by the owner agency that is associated with the particular structure.
- **CDBRR Date** – The date the CDBRR is filled out by the inspector.
- **Operational Status Check Boxes** – Check the appropriate box(es) to describe the type(s) of restriction imposed immediately after initial incident clean-up and inspection:
  - **Bridge Closure** – A complete closure to traffic as a result of structural damage to critical components.
  - **Lane Closure** – The inspection results in the closure of one or more lanes due to structural problems.
  - **Temporary Load Posting** – The inspection results in the temporary load posting of the bridge until repairs can be accomplished.
  - **Other Restriction** – If limits are placed on a bridge for some other reason than the three listed above, the Other Restriction option may be selected. (Example: sidewalk closure due to structural defect.) This item may be used to further explain any closures, postings, restrictions or other actions taken with the damaged structure. This explanation shall be documented within the Mitigation Measures Taken section of the CDBRR as described below.
- **Lead Inspector's Name/CDBRR Author** – The team leader that performed the inspection or the person completing the CDBRR. (These are usually one and the same. On infrequent occasions, the CDBRR may be completed without there having been an inspection by BPO.)
- **Lead Inspector Cert#** – The team leader's certification number. (Leave blank if there was no inspection by BPO.)
- **Co-Inspector's Name** – The assistant inspector to the team leader. (Leave blank if there was no inspection by BPO.)
- **Inspection Date** – The date when the inspection of structural deficiencies took place. (Leave blank if there was no inspection by BPO.)
- **Incident Reported to the owner agency by** – The individual that reported the damage to the owner agency. (Leave blank when not applicable.)
- **Date Reported** – actual date when the incident was reported to the owner agency. (Leave blank when not applicable.)
- **Phone Number** – Contact number for the individual that reported the incident. (Leave blank when not applicable or unknown.)

2. **Incident Information** – This portion of the CDBRR describes the incident information along with the deficiencies found on the structure. The items within this section of the CDBRR are described below.
   - **Description of Incident** – Description of the incident that caused damage to the structure, if the information is available.
   - **Description of the Facilities Damaged** – Detailed description and locations of damage to the structure. For example, on over height collisions, the team leader should measure and identify the extent and degree of the damage as well as the vertical clearance at the point of impact.
   - **Mitigation Measures Taken** – Description of any actions taken to safeguard the traveling public until recommended repairs can be made.
   - **Description of Recommended Repair(s)** – Description of repairs required to correct the deficiencies noted. This may be added while on-site or sometime after the field visit prior to submitting.
3. **Intermediate CDBRR Updates** – This section is filled out whenever an intermediate update to the CDBRR is made. See Section 6.02.B for CDBRR submittal requirements.

   Multiple Intermediate Updates are possible.

   The items within this section of the CDBRR are described below:
   - **Description of Update** – Description of the information to be updated. Insert initials/date in front of the description. This information is to remain in the report as subsequent intermediate updates are made. Insert initials/date in front of each individual description.
   - **Submitted By** – The individual who most recently updated the CDBRR.
   - **Date Submitted** – The date when the CDBRR is updated.
4. **Post Repair Update** – This section is filled out only when all repairs necessary to reopen the structure to unrestricted traffic have been completed. This section is generally to be completed within one month after completion of the recommended repairs has been verified. This section is typically filled out by the Repair Specialist. See Section 6.02.B for CDBRR submittal requirements.

   The items within this section of the CDBRR are described below:
   - **Description of Work Done** – Description of repair work performed to correct the deficiencies to the structure. The appropriate verification photos may be attached as needed.
   - **Date of Repair Completion** – Date when the actual repairs were completed and restrictions removed. If the completion date is not known, use the date verified by BPO.
   - **Submitted By** – The individual who updated the CDBRR.
   - **Date Submitted** – The date when the CDBRR is updated.

B. CDBRR Reporting

1. **CDBRR Submittals** – After the Damage Inspection is performed, the typical CDBRR will only contain information within the Bridge/Inspection Team section and within the Incident Information sections. Once completed, the team leader must place a PDF copy of the CDBRR in the ”Files” tab of BridgeWorks for the respective structure, and send a copy of the report to the Bridge Preservation Engineer (for State bridges) or the WSDOT Local Programs Bridge Engineer (for local agency bridges). The information shall also be entered in the follow-up tracking system (by the Bridge Preservation Supervisor or his delegate), all within three (3) business days after identifying the damage. For NBI reportable structures, the Bridge Preservation Engineer or the WSDOT Local Programs Bridge Engineer will then forward a copy of this report to the FHWA Division Bridge Engineer as soon as possible but no later than five business days after identifying the damage.

   Team leaders for the State are required to save the current XML file and a PDF copy of the CDBRR and all other electronic files, including emails and photos, associated with the Damage inspection into the Bridge Damage folder on the network. Damage inspections requiring a CDBRR and subsequent UPDATES are saved into W:\Data\Bridge Damage\CDBRR Events\(Inspection Year) directory.

   State team leaders are also required to send an email to the Bridge Preservation Engineer and the Bridge Preservation Supervisor, with a cc to the Load Rating Engineer, informing them that the CDBRR form is complete and saved within Bridge Damage Folder as described above.

2. **Post Repair Reporting** – The purpose of the CDBRR is to provide accurate and timely information to other interested parties, as well as to provide accountability, hence the requirement for submission of the Post Repair Update as soon as possible after satisfactory verification of the completion of the work and the removal of traffic restrictions.

   The individual who completes the final UPDATE on a CDBRR may have to rely on reports and photos from those who have actually done the repair work. This is understandable and justified, recognizing that those who actually perform the work may not be the same person responsible for the bridge inspection and reporting. It is permissible in certain circumstances to verify the work and complete the Post Repair Update from the office based upon reports received from others. Consult with your supervisor, the Bridge Preservation Supervisor, or the Bridge Preservation Engineer to make the decision and to determine how the information is to be entered into the database (usually by Informational Report).

   However, it remains a good and expected practice to have trained team leaders field verify that all the repairs are complete and satisfactory. If changes in condition coding are not anticipated, the follow-up verification inspection (one-time interim) is to be conducted within six months of completion of the required work. But in cases where NBI/BMS condition codes were reduced due to the incident and may be considered for increase after completion of the repair work, the follow-up verification inspection should be conducted as soon as possible following completion of the repair work.

After the repair verification is complete (from the office or by field inspection), a copy of the Post Repair Update shall be placed in the bridge file, a copy is also sent to the Bridge Preservation Engineer (for State bridges), or the WSDOT Local Programs Bridge Engineer (for Local Agency bridges), and the follow-up tracking system shall be updated (by the Bridge Preservation Supervisor or his delegate). For NBI reportable bridges, the Bridge Preservation Engineer or the WSDOT Local Programs Bridge Engineer will then forward a copy of this report to the FHWA Division Bridge Engineer. Update and resubmit the NBI and BMS data as necessary and described in Chapter 3.

6.03 Other Damage Reports

Most damage inspections do not end up requiring a CDBRR. The most common case is related to vehicular impact damage, but other situations (e.g. scour, fire, sudden joint failure) are possible.

For those damage inspections that do not require a CDBRR, complete the Damage Inspection Report (DIR) as outlined in Chapter 3. For some cases of minor damage that are not likely to require a structural repair and where the region has not specifically requested our assistance a field inspection may not be required by BPO. Consult with your supervisor, the Bridge Preservation Supervisor, or the Bridge Preservation Engineer for further guidance. For such cases, the DIR may be completed using information provided by the region or other sources. On occasion, a DIR may not be needed at all for vehicular impact incidents requiring nothing more than minor cosmetic repair provided there are not legal or cost recovery circumstances involved. Consult BPO management to make the determination.

For all cases involving vehicular impact and requiring a DIR, the lead inspector assigned to respond to the incident shall provide within 3 working days of initial notification the following information in an e-mail addressed to the Bridge Preservation Supervisor and to the Repair Specialist:

- Structure ID; Bridge Number; Bridge Name; Bridge Location (MP)
- Date of Incident (if known; note if unknown)
- Description of Incident
- Identity and contact info of the person or office who reported the incident to BPO (note if unknown)
- Date the incident was initially reported to BPO
- Date of BPO Inspection; names of Lead Inspector and Co-inspector (actual date, expected date, or a note if no field inspection is expected)
- Brief description of damage to the structure
- Brief description of anticipated repair recommendations
- Status of inspection/report (for those cases where an inspection is expected)

All inspection related damage photos and sketches shall be uploaded to the Damage Directory on the network (W:\Data\Bridge\BridgeDamage\Year xxxx\[bridge no.] [structure type] [incident date]).

Permission levels for this network location are set such that information can be uploaded to and/or copied from this directory, but edits and deletions can only be made by select individuals (Bridge Preservation Supervisor, Repair Specialist, QA Engineer). Notify one of these individuals if corrections/deletions are needed.

6.04 Bridge Repairs

A. New Repair Entries

When a bridge inspection identifies a routine structural or non-structural deficiency, i.e., any deficiency that is not identified in Section 6.02, a repair note describing the deficiency and recommended repair should be written in the Bridge Inspection Report (BIR).

1. **BIR Repair Note** – The State utilizes the following guidelines when describing and documenting deficiencies needing repair.
   - Deficiencies that require repairs shall be documented in the body of the BIR with the associated BMS elements.
   - The description of the deficiency should be concise and detailed, including location and size of the defect.
   - Photos of deficiencies requiring repairs shall be taken for proposed and completed repair of any priority. Multiple photographs of a defect, including an overall view along with close-ups, are recommended.
   - A "REPAIR" notation should be put in the individual element note with the appropriate repair number. The repair number is generated by BridgeWorks and is referenced in the "Repairs" tab of the program.

   Example: Stringer F in Panel 2 at Floor Beam 2 has a 4-½" long crack at the top cope. See photo #7. REPAIR #12345.

2. **Repair Entry** – Repair entries for deficiencies found during the course of a bridge inspection shall be entered within the "Repairs" tab found in the BridgeWorks program.

   The repair entry should include:
   - Priority for the repair
   - Repair responsibility for the repair
   - Date when the repair was first noted
   - Accurate description of the repair required
   - Proper identification of specific repair location(s). (In addition to notes in the description, consider adding a map and/or spreadsheet to the Files tab for any case that might be at all confusing to those who may not be not intimately familiar with our terminology and layout on a bridge.)
   - Photograph(s) of the damaged area
   - Notice of any difference in the bridge orientation (pier numbering) from that in the plan drawings accessible on BEISt

   It is recommended that repair entries with multiple items similar in nature are contained within the same repair. Do not put multiple repair items in the same repair note, unless they are similar.

   Similar – Replace 10 ft. red tagged (RT) timber cap at Pier 2 and 5 ft. RT timber cap at Pier 3.

Not Similar – Replace upper 10 ft. RT timber Pile 5A and entire RT timber cap at Pier 6.

Due to the number of repairs generated for similar components, the State utilizes standard descriptions for similar types of repairs called the "Repair Protocols" which are located at W:\Data\Bridge\BridgeRepair\Repair Protocols. Contact BPO for examples and additional guidance for the protocols. For any repairs that are likely to require additional repair instructions from the BPO office, advise the Bridge Preservation Supervisor and the Repair Specialist of that need.

3. **Repair Responsibility** – Repair responsibilities utilized within the BridgeWorks program organizes repairs into separate repair types. The state utilizes these repair types to assign responsibility to the various entities that will, in most cases, ultimately perform the repair.

   The following repair responsibility codes are utilized by team leaders for the state.

   - **B – Bridge Repair**

     These repair responsibilities are generally associated with the bridge or conditions that impact elements of the bridge to include structural deficiencies, non-scour related erosion or conditions preventing proper inspection. Regional bridge crews are typically charged with completing these types of repairs for state structures.

     Note: Regional Inspection staff are not expected to conduct in-depth inspection on bridge mounted signs and sign supports, but are expected to stay alert to obvious defects that can be safely observed and that may need further inspection and/or repair. Such defects on bridge mounted signs are to be communicated to the BPO sign bridge team at the first opportunity. They will typically provide repair recommendations via the Sign Bridge Repair List. But for a severe defect, direct communication to the regional bridge crew can and should be made if the BPO sign bridge crew is not available for quick response. Keep a record of any such communication and provide it to the BPO sign bridge team.

   - **V – Vertical Clearance Repair**

     This indicates that the bridge has restrictive overhead clearance for vehicular traffic and that no signing or improper signing is in place. Vertical clearance signs are required for measured clearances less than or equal to 15′-3″ and the policy for the State is to post at a height 3" less than measured. Measured clearances less than 14′-3″ require advanced restrictive height warning signs as defined in the updated MUTCD. State team leaders shall follow the guidelines in Section 3.04.1.J for further instructions on vertical clearance repairs. The Bridge Preservation Office (BPO) Geometry Engineer is tasked with keeping track of vertical clearance issues and repairs for State structures. Regional Sign crews are typically charged with completing these types of repairs for state structures.

- **S – Scour Repair**

  This indicates that the bridge site needs to be evaluated for scour mitigation. A description of the condition of concern must be provided in the inspection notes. Repair actions to correct the condition should be included in the repair description. The BPO Scour Engineer or the Local Agency's hydraulic engineer will review and may revise the recommended repair, the repair priority, or may deactivate the repair altogether after careful review of the bridge site. A note by the hydraulic specialist should be added to the inspection report detailing their findings, typically within the note of WSBIS Item 1680. Regional bridge crews are typically charged with completing these types of repairs for state structures.

  Engineering scour mitigation requires the engineer to work closely with environmental agencies to develop the best corrective action plan for all. Erosion caused by runoff from the bridge is not considered a scour repair.

  Team leaders for the state shall apply the following guidelines when selecting a Scour repair responsibility.

  – For new scour repairs or monitoring, enter an (S) scour repair (responsibility) and assign it a Priority 0, see Section 6.04.A.4. Notify the Bridge Scour Engineer, including photos, sketches and any other information. Code BMS Element #361 in the BIR and provide notes with the date that the scour engineer was contacted. The scour engineer will review the conditions and set the priority.

  – For existing repairs, for scour with a set priority, insure that the repair (responsibility) is changed from a (B) to an (S) and leave the existing priority as it is set. If the existing priority is (S), set it to 0 and notify the BPO Scour Engineer.

  – When a change in condition to an existing repair for scour is identified, insure that the repair (responsibility) is changed from a (B) to an (S). Notify the BPO Scour Engineer, including photos, sketches and any other information. Code BMS Element #361 and describe the change noting the date that the scour engineer was contacted.

Example	Responsibility	Priority	
New Repair	S	0	Comment and notify Scour Engineer
Exist Repair	B S	1 (Leave)	
Exist Repair	B S	S 0	Notify Scour Engineer
Change	B S	1 (Leave)	Comment and notify Scour Engineer
Verify	B S	1 (Leave)	Comment and notify Scour Engineer

- **R – Railroad Repair**

  WSDOT conducts limited scope (non-structural and non-mandated) "Safety" inspections of railroad owned bridges that cross over state-owned highways. The R repair indicates that a railroad owned bridge crossing over a public highway has a condition that could pose a hazard to the motoring public, such as ballast falling onto the roadway. The repair description should include some indication of the relative urgency of the recommended repair. The inspecting highway agency (WSDOT or local agency) must ensure that all such repair recommendations are communicated to the appropriate department/individual

at the correct railroad. For higher priority conditions, consider reducing the inspection frequency.

Note: Vertical clearance signage needs on a railroad overcrossing will likely become the responsibility of the region. Assign such repairs the responsibility code V as outlined above.

- **U – Utility Repair**

  This indicates that there is a deficiency with a utility (not owned by the bridge owner) mounted to the bridge. The inspecting highway agency (WSDOT or local agency) should ensure that all such repair recommendations are communicated to the appropriate department/individual at the correct utility. If the deficiency poses a safety risk to the traveling public or to bridge inspection and maintenance crews, or if the deficiency is creating a problem for the structural integrity of the bridge, then the repair recommendations must be communicated to the appropriate department/individual at the correct utility. The Risk Reduction Engineer may be able to facilitate the communication in urgent situations.

- **J – Roadway Repair**

  This indicates that there is a non-bridge related deficiency in the roadway approach to a bridge. Regional roadway maintenance crews are typically charged with completing these types of repairs for State structures. Deck joints and defects on both sides of the abutment headers are B repairs and not J repairs.

4. **Repair Priority** – The priority of the required repair establishes the urgency at which the repair shall take place. The priority may evolve into a more urgent priority if repairs are not completed.

   - **Emergency** – Repair work requiring immediate action when structures are partially or completely closed.
   - **Urgent** – Repair work requiring prompt action and must be completed when structural details and bridge crews become available.

     Emergency or Urgent repair needs must be communicated directly to the region maintenance staff (or bridge owner) via phone call and follow-up email. Copy the Bridge Preservation Supervisor and the Repair Specialist on any such communication.

     There is no specific "Emergency" or "Urgent" priority designation in the inspection application and these repairs may not always end up being published in the Bridge Repair List on BEISt. (A not uncommon example of an emergency repair is a deck hole-through where the hole is reported to the region maintenance crew by others and they respond and fix it immediately. In such a case, the bridge office may not send a crew or prepare an inspection report until well after the defect has been repaired.) But whenever an emergency or urgent repair need is entered into the application, the repair entry must be assigned an appropriate priority from the following listings (usually Priority 1 but sometimes Priority C when a CDBRR event is involved.)

- **Priority C** – Priority C is to be assigned to any CDBRR related repair entry that must be completed before the bridge may be returned to the level of unrestricted service that existed before the event. Priority C is to only be used in conjunction with a CDBRR event. Do not use Priority C for repairs that do not directly lead to a lifting of the restrictions imposed as a result of the CDBRR event. Completion of a Priority C repair (by maintenance or by contract) will require follow-up by inspectors to verify the repair entry(ies), review condition coding, update the CDBRR, and disseminate the information to the appropriate individuals. Completion of a Priority C repair must be communicated directly to the Bridge Preservation Supervisor and the Repair Specialist. See Section 6.02.B for CDBRR reporting requirements.
- **Priority 1** – A Priority 1 repair describes a deficiency to a primary bridge element that could cause a major impact to the bridge such as load restrictions. This type of deficiency may lead to more extensive and costly structural repairs if not completed as soon as possible.

  Priority 1 is the highest priority assigned to a repair which if left uncompleted, could turn into an urgent or emergency repair during next inspection.

  Priorities 1 and C are the highest priorities that can be assigned within the inspection application.

  These repairs are top priority to ensure:
  - Public Safety
  - Reliability of the Transportation System
  - Protection of Public Investments
  - Maintenance of Legal Federal Mandates

  On occasion, the inspection frequency may need adjustment to ensure that conditions since the previous inspection have not deteriorated to urgent or emergency status, that safety of the traveling public has not become compromised, and that inspectors may verify that repairs have been done in a timely manner. Additionally, the Rating Revision flag (WSBIS Item 2688) may require a "Y" to reexamine the bridge for load carrying capability.

  Examples of deficiencies requiring Priority 1 repairs are as follows:
  - Repairing exposure of damaged strands and/or rebar.
  - Removing or mitigating any existing potential for material falling from the bridge.
  - Repairing significant joint defects that impact the bridge or create traffic hazards such as 'D' spalls in the header with exposed steel.
  - Trimming or removal of trees, brush or debris that interferes with inspection procedures or equipment access. List the month and year of the next inspection by which this repair needs to be completed.

- **Priority 2** – A Priority 2 repair describes a minor to moderate deficiency to a primary bridge element or a major deficiency to a secondary bridge element. This type of deficiency would not cause major impact to the level of service of the bridge or compromise safety. But, this type of deficiency may lead to more extensive and costly structural repairs if not completed in a timely manner.

  Priority 2 is different from Priority 1 in that a Priority 2 deficiency does not immediately jeopardize:

  – Public Safety
  – Reliable Transportation System
  – Protection of Public Investments
  – Maintenance of Legal Federal Mandates

  A Priority 2 repair would not generally be cause for a reduction in inspection frequency or a reexamination of a bridge's load rating.

  Examples of deficiencies requiring Priority 2 repairs are as follows:

  – Repair Yellow-tagged (YT) timber members.
  – Repair spalling in secondary members.
  – Repair spalling in the deck soffit and/or concrete girders. If not excessive, this could be a Priority 3.

- Priority 3 – A Priority 3 repair is generally a minor nonstructural or "Housekeeping" type of repair that could evolve into a higher priority if not corrected.

  Examples of deficiencies requiring Priority 3 repairs are as follows:

  – Cleaning of drains, bridge members or deck and sidewalk surfaces.
  – Remove debris from off of pier caps and abutments.
  – Remove garbage, debris or vegetation from around abutments piles or retaining walls.
  – (Note that all such repairs shall be elevated to priority 1 if the material of concern is significantly impeding operation of bridge structural components or is making complete structural inspection of the bridge impossible.)

- **Priority M** – Monitor repairs require no action from the region bridge crews, but they should be aware of the condition, since the problem/defect could evolve into a repair. A reduced inspection frequency may be necessary in order to monitor the problem/defect. The state utilizes the following guidelines when implementing and administering monitor repairs.

  – Every monitor repair note must be updated at each routine or interim inspection with a clear statement of findings. This update including the inspection date, inspector initials, and notes on the changed condition will be appended to the existing repair note. If the condition is unchanged state, "No changes noted" and include the year and initials. This specific instruction applies to monitor repairs only.

- Every monitor repair note must include measurable information about the condition of interest, allowing subsequent inspectors to more easily and accurately determine if the condition is changing. Photos, sketches, and/or measurements are among the ways to provide this information, which must also clearly include location and date. It may be appropriate to reference an attached file with historical data in the monitor repair note.
- Over time, every monitor repair note will provide information on what circumstances warrant repair action. Inspectors will be expected to provide this information when possible, but it is recognized that this information may require more detailed evaluation and structural analysis beyond the scope of bridge inspection work.

  Some existing monitor repairs may not meet the requirements listed above. In this case, please coordinate with the Bridge Preservation Supervisor to determine if a monitor repair is appropriate.

- **Priority 0** – A Priority 0 repair is typically used only for J repairs and other repairs not directly attached to, or affecting the bridge. This priority is also used for new scour repairs, as a flag to the WSDOT Scour Engineer, to indicate the need for review and actual assignment of the proper priority.

  However, for J and U repairs, inspectors must use judgment in determining the impact of the situation. If an existing condition directly impacts the structure, presents a safety hazard, or interferes and prevents the bridge from being properly inspected a Priority 1 should be assigned. Conditions creating a hazard to pedestrians or traffic need to be reported to the region by the inspector as soon as possible and a note of the communication identifying the date, time and point of contact should appear in the repair note.

B. Modifying Existing Repairs

When there is need to change or update the verbiage within a repair entry after subsequent inspections, team leaders for the State shall apply the following guidelines when modifying the repair.

- The team leader shall add his/her initials along with a date in parenthesis with a brief description of any changes to an existing repair note, including a priority change.
- Minor edits to repair text (spelling, caps, minor grammatical changes) should generally be avoided unless something else is being done to the entry.
- Edits to repair priority entries other than priority M need be made only when the conditions/needs change sufficiently to warrant an update.
- If a significant change to a repair is needed, eliminate the original repair entry by entering a date in the "Verified" column. Add a note in parenthesis in the repair description stating reasons for its removal, and then enter a new repair with the original repair date in the "Noted" field. (The application typically enters today's date in the Noted field when a new repair is created. The Noted date can be changed by the inspector and must be changed in all cases where the contents of a previous repair entry are entered into a new repair entry.)
- Break out and rewrite repairs when dissimilar elements are called out in the same repair as described in Section 6.04.A.2. Date the new repair with the original repair date for the respective elements.

C. Repair Verification

At each routine inspection, the current status of all open (not previously verified) repair entries must be reviewed by the inspection team and field reviewed provided the necessary access equipment is available. If the recommended work has been completed, the repair entry in the BIR shall be verified in accordance with the following guidelines.

- BMS element condition states and notes where the repairs are referenced must be updated to accurately describe the repaired condition after the inspection.
- Any portion of a primary BMS element that has been repaired is typically coded in Condition State 2. Primary members that have been completely replaced should be returned to Condition State 1.
- A completed repair should have before and after photos with the verification date and the repair number referenced in the individual BMS element note. Remove this verification note during the subsequent inspection.

  Example: Stringer F in Panel 2 at Floor Beam 2 crack has been stop drilled. REPAIR #12345 verified on 1/20/02. See photos #7 and #9.
- In the "Repairs" tab of BridgeWorks, the team leader should enter the verification date within the "Verified" column and attach the after photos to the "Photo" column.
- Explain in the repair description why verification could not be accomplished and what it will take to do so for the next inspection (equipment, environment, etc.).

Repairs to state structures are most often performed by region bridge maintenance crews. Their work is often reported to BPO via a Maintenance Bridge Repair Report (MBRR) (see also Section 6.05). When this is done, the BridgeWorks application uses the info entered in the MBRR to enter a Maintenance Date (Maint).

The Maint date informs the bridge inspection team that the work specified by the repair entry has been completed. Once the date is entered, the responsible maintenance crew does not typically revisit this repair entry. The bridge inspection crew's responsibility at this point is to verify that the reported maintenance satisfactorily completes the recommended repair(s). When a Maintenance date has been entered, consideration should be given to the need to schedule appropriate access equipment prior to heading out to the field. Discuss with your supervisor as needed.

There are, on occasion, repair entries within BridgeWorks that contain inappropriate or unexplained maintenance completion dates. Scenarios include, but are not limited to:

1. The work performed does not complete the full scope of the original repair recommendation;
2. The work performed is not satisfactory;
3. Further deterioration has occurred rendering the work performed inadequate;
4. There is no visual evidence of any work done; (e) the work performed belongs in fact to a different repair entry (i.e., the MBRR was improperly entered).

In cases such as these, correction is needed to ensure that the repair needs continue to be properly communicated back to the region bridge maintenance crews.

The team leader shall apply case-by-case judgment in making these corrections. Two primary options should be considered:

- **Option A** – Add a verified date with photos and/or notes in the repair description (does not have to be both provided there is no question of the intent). Write a new repair entry with appropriate supporting information and noting the changes being made. (***Example:*** A repair entry of large scope has been partially completed. The existing entry could be verified, the description modified to note the portion that was completed, and the new entry would be referenced. The new repair entry would reference the old entry, note the partial completion and would describe the remaining scope. In most cases, the noted date of the new entry should be the same as the original entry.)
- **Option B** – Enter an Override Date in the BridgeWorks application. Modify the repair description to explain the reason for the override and provide the date and initials of the author. (This option may be most appropriate for a case where the Bridge Repair report was incorrectly entered. It could also be appropriate for the case where only a small part of the overall scope of a repair was addressed by the work in the Bridge Repair Report.)

In some extreme and/or complex cases, direct communication with the region bridge maintenance crew to explain the situation may also be advisable.

6.05 Maintenance – Bridge Repair Report (MBRR)

The repair descriptions from the inspection reports for WSDOT-owned bridges are entered into the “Bridge Repair List” (BRL - a state document), which can be viewed on the internal homepage of the WSDOT website. The BRL is updated twice a year. Maintenance crews for the State will review the list and schedule the work to complete selected bridge repairs. When a repair is completed, the maintenance crew may submit a Maintenance – Bridge Repair Report (MBRR) documenting the completed repair. The MBRR is typically submitted electronically via a link provided on the Bridge Repair List website. If submitted electronically, the program inserts a “maintenance date” for that repair into the database. Entering the maintenance date will automatically remove the repair from the next edition of the printed active “Bridge Repair List”. However, the unverified repair along with the maintenance date will still appear in the next Bridge Inspection Report (BIR). The MBRR is a state document, but it is available to Local Agencies for utilization if they do not have a bridge repair documentation process in place.

An example of a completed Maintenance - Bridge Repair Report can be found at the end of this chapter.

6.06 Forms

Critical Damage Bridge Repair Report

Critical Damage Bridge Repair Report - Instructions

Maintenance - Bridge Repair Report Example

Washington State Department of Transportation

☐ CDBRR

Critical Damage Bridge Repair Report

☐ Update

Agency Name	Structure ID	Bridge Number	MP	Incident Date

Bridge Name	CDBRR Date:	Check all that apply (Top three require a CDBRR)	
Lead Inspector's Name/CDBRR Author	Lead Inspector's Cert#	Bridge Closure	☐
		Lane Closure	☐
Co-Inspector's Name	Inspection Date	Temporary Load Posting	☐
		Other Restriction	☐
Incident Reported to BPO by	Date Reported	Phone No:	

Incident

Description of Incident

Description of Damage to the Structure

Mitigation Measures Taken (And explain in more detail any closures, postings, restrictions or other actions taken)

Description of Recommended Repair(s) (This may be added while on-site or sometime after the field visit prior to submitting)

Intermediate CDBRR Update:

Description of Update:

Update Submitted By:	Date Submitted:

Post Repair Update : For use by the Repair Specialist
This section to be completed within 1 month after verified completion of recommended repair.

Description of Work Done

Date of Repair Completion or BPO Verification Date If Completion Date Is Unknown	Update Submitted By (Print Name)	Date Submitted

Page 1 of 1

Critical Damage Bridge Repair Report

A CDBRR is required whenever one of the four conditions in the red box below have been executed.

Washington State Department of Transportation

Critical Damage Bridge Repair Report

☐ CDBRR

☐ Update

Agency Name	Structure ID	Bridge Number	MP	Incident Date

Bridge Name	CDBRR Date:	Check all that apply

Lead Inspector's Name/CDBRR Author	Lead Inspector's Cert#	Bridge Closure ☐
		Lane Closure ☐
Co-Inspector's Name	Inspection Date	Temporary Load Posting ☐
		Other Restriction ☐
Incident Reported to BPO by	Date Reported	Phone No:

Incident

Description of Incident

These text fields expand as the line is filled. If more than 255 characters are in any of these lower boxes

Description of Damage to the Structure

the boxes will be outlined with red dashed lines. Ignore the validation error pop-up box when saving the file

Mitigation Measures Taken (And explain in more detail any closures, postings, restrictions or other actions taken)

Save the file following the prescribed naming convention.

Description of Recommended Repair(s) (This may be added while on-site or sometime after the field visit prior to submitting)

Create a PDF copy and store both that and the .xml copy in the Bridge Damage folder.

Intermediate CDBRR Update:

Description of Update:

This text field expands as the line is filled.

Update Submitted By:	Date Submitted:

Post Repair Update : For use by the Repair Specialist

This section to be completed within 1 month after verified completion of recommended repair.

Description of Work Done

Date of Repair Completion or BPO Verification Date If Completion Date Is Unknown	Update Submitted By (Print Name)	Date Submitted

Do not fill out this section outlined in red unless returning to the site to report on the repairs that have been completed - The Update Report type up above (top right corner) would be selected at this time.

The final procedure once the form is completely filled out is to create a pdf copy of it for placement into BridgeWorks. The XML file should not be placed in BridgeWorks. Place both copies (XML & pdf) in the Damage folder with any other documentation, photos etc. per WSBIM procedures in Ch. 6.

Page 1 of 1

Critical Damage Bridge Repair Report - Instructions

BEISt - Maintenance Report Page 1 of 1

To: Bridge Preservation Office
PO Box 47341, Olympia, WA 98504-7341

Maintenance Date 2006-07-18

Structure Identifier **0005090A** 10000

Bridge Number **5/321** Bridge Name **CAPITOL LAKE**

Mile Post **104.52** Location **0.5 N JCT US 101**

Repairs Completed By
B - Bridge Maintenance

Origin of Repairs
B - Bridge Repair List Repair No **S10000**, Priority **1**, Dated **2003-12-03**

Repair Description
Repair the strip seal at the north abutment. (verified - repair completed but has failed again; see new repairs 10002-4)

Type of Materials Used - Suppliers
Sand blast and sika-flex with backer rod

Repair Remarks and Details
Cleaned expansion joint by sand blasting and poured sika- flex joint.

Weather Conditions

Completed By Steve McIntyre **Posted Date** 2006-07-18 **Map Repair** No

Maintenance - Bridge Repair Report Example