

VIRGINIA DEPARTMENT OF TRANSPORTATION

STRUCTURE AND BRIDGE DIVISION

INSTRUCTIONAL AND INFORMATIONAL MEMORANDUM

GENERAL SUBJECT: Bridge Safety Inspections	NUMBER: IIM-S&B-27.8
SPECIFIC SUBJECT: Inventory and Inspection Requirements for Bridges and Large Culverts	Date: June 30, 2016
	SUPERSEDES: IIM-S&B-27.7
DIVISION ADMINISTRATOR APPROVAL: /original signed/ Kendal R. Walus, P.E. State Structure and Bridge Engineer Approved: June 30, 2016	

Changes are shaded

INTRODUCTION:

The attached instructions are intended to complement the National Bridge Inspection Standards (NBIS) found in the Code of Federal Regulations Title 23 Highways – Part 650, Subpart C; *The Manual for Bridge Evaluation* (MBE), published by the American Association of State Highway and Transportation Officials (AASHTO); AASHTO Manual for Element Inspection First Edition, and the AASHTO Movable Bridge Inspection, Evaluation, and Maintenance Manual. For the remainder of this document the Virginia Department of Transportation shall be referred to as VDOT.

A list of Bridge Safety Inspection Documents referenced in this memorandum may be found at the following – http://www.virginiadot.org/business/bridge_safety_inspection.asp.

DEFINITIONS:

For the purposes of this memorandum, unless otherwise noted, the term 'structure' will encompass both bridges and culverts.

Bridge: Any structure not defined as a culvert and which typically has deck, superstructure and substructure components. Some bridge structures may have integral deck and superstructures – i.e. slab/box beams, T-beams, rigid frames, etc. In these cases, the deck and superstructure may be considered separately for condition assessment, however, general condition ratings (GCR's) shall not vary by more than one for the deck and superstructure.

Bridge Record: Cumulative information about an individual bridge or culvert meeting the Federal definition of a bridge as defined in the MBE.

Close-up Inspection: Inspection performed while having a clear unobstructed view of the detail or member in question (typically within 12 feet or one lane) such that it can be determined if defects are present. While binoculars (and other optical enhancements) can be used to supplement a visual inspection, they shall not be used in lieu of methods and requirements defined herein.

Complex Bridges: This category of structures includes movable, cable-stayed, segmental concrete, and other bridges with unusual characteristics. These types of structures will require specialized inspection procedures or specialized personnel/inspector training and experience. A specialized inspection procedure, additional personnel/inspector training and experience required to inspect complex bridges will be developed prior to the scheduled inspection taking place. The complex bridges shall receive routine and in-depth inspections according to those procedures. These bridges shall be identified in the inventory.

Culvert: Any structure that has an integral floor system that supports the sidewalls and provides a lined channel. A culvert has no distinction between substructure and superstructure and typically has no deck. Multiple box or pipe culverts will be considered a single structure where the clear distance between openings is less than half of the smaller contiguous opening. Otherwise, each opening shall be considered a separate structure.

Element Inspection: An inspection in accordance with the AASHTO Manual for Bridge Element Inspection and VDOT Supplement that includes defining the total quantity of National Bridge Elements (NBEs), Bridge Management Elements (BMEs) and Agency Developed Elements (ADEs) present and assessing the quantity to be included in the condition states for each element present.

Entities: Localities (municipalities), other agencies, toll authorities and other non- VDOT organizations that own and maintain NBIS structures.

Fatigue and Fatigue Prone Details: The definition of fatigue is the tendency of a member to fail at a stress level below its yield stress when subject to cyclical loading. Fatigue prone details are details meeting the AASHTO fatigue detail categories of C through E' on bridges meeting at least one of the following two criteria: either carries a route that has 500 or more trucks per day or carries an interstate route.

Note that the classification of fatigue prone details by category does not apply to all details and some details may be considered fatigue prone due to other conditions and forces. These conditions will typically cause localized stress concentrations. See appendix for a list of typical fatigue prone details. Engineering judgment is required to recognize and assess structure specific fatigue prone conditions.

Fracture Critical Bridges: Bridges that contain fracture critical members and carry vehicular traffic.

Fracture Critical Member (FCM): Metal member or element that is subjected to tension forces and whose failure would “likely” cause a portion of or the entire bridge to collapse.

Hands-on Inspection: An inspection performed within an arm’s length of the detail or member being inspected. This is intended to mean the inspector is close enough to touch the member or detail should magnification, testing, measurement or other quantification methods be needed.

In-depth inspection: A routine inspection in combination with inspections of one or more members above or below the water level utilizing advanced techniques in addition to visual techniques to identify deficiencies not readily detectable using routine inspection procedures. This type of inspection will be required for complex bridges or structures identified by VDOT, with pre-defined inspection techniques, for a special assessment of one or more components or the entire structure. Additionally, this type of inspection is commonly associated with determinations of structural integrity of compromised members.

Initial Inspection: First inspection of a structure when it becomes part of the highway system and an active record in the inventory.

Interim Inspection: Special inspection to assess or monitor structural damage, a structural deficiency, or any other feature of a structure that needs to be inspected on a specific frequency. Interim inspections are typically performed more frequently than the regular inspection. Only those features requiring the interim inspection need to be inspected. A cursory inspection shall be performed of other components, members and elements (with an emphasis on those in fair or poor condition) while inspectors are on site.

Large Culvert: A culvert that either meets the definition of a Non-NBI structure in this IIM or a culvert that meets the definition of a structure as defined in Federal item 112 (Recording and Coding Guide for the Structure Inventory and Appraisal of the Nation’s Bridges) in the NBIS.

NBI: Abbreviation for “National Bridge Inventory.” In the context of this memorandum when a structure is referred to as an NBI structure it meets the federal definition of a bridge as defined in the NBIS.

Non-destructive Testing (NDT): A diverse group of analysis techniques to evaluate the properties of a material, component or system without causing damage.

Non-NBI: A structure to be included in the VDOT Structure Inventory that does not meet the NBI definition above. Structures in this category include, but are not limited to, culverts and bridges less than 20 feet between undercopings of abutments or between springlines of arches and structures which do not carry highway traffic (i.e. railroad structures, pedestrian structures, footbridges, etc.). A culvert in this category can be a single barrel or have a number of barrels where the clear distance between openings is less than half of the smaller contiguous opening and the total hydraulic opening is equal to or greater than 36 square feet.

Nonscheduled/Damage Inspection: Inspection to assess structural damage resulting from environmental factors or human actions or to inspect changed conditions of elements due to construction or maintenance activities when the NBI schedule will not be adjusted accordingly.

Past Due Inspection: Inspection that did not take place in or before the month it was due.

Regular/Routine Inspection: Inspection which meets the requirements of a routine inspection as defined in the NBIS and MBE. In this memorandum, the terms regular and routine are used interchangeably.

Underwater Inspection: Inspection performed by trained and qualified divers to assess the condition of submerged structure elements that otherwise cannot be inspected through the normal wading inspection as part of the NBI scheduled underwater inspection or to supplement regular or nonscheduled inspections.

Unobstructed View: View of a component or an element that is not visibly obstructed by another object or member, dirt, debris, vegetation, corrosion, etc. This is also applicable to lighting conditions that may cause shadows across components or elements to be inspected.

ROLES AND RESPONSIBILITIES:

Structure and Bridge – Central Office

The Central Office Structure and Bridge Division shall have overall responsibility for the statewide compliance with the inventory and inspection policy standards and procedures of all NBI and VDOT maintained Non-NBI structures.

Structure and Bridge – District

Each District Structure and Bridge Section shall maintain an organization that will inspect, or cause to be inspected, all structures defined in this memorandum as NBI or VDOT maintained Non-NBI structures. District Structure and Bridge Sections shall have overall responsibility for compliance with the NBIS and VDOT requirements of all structures within their respective district, including other entities.

District Structure and Bridge Engineer (DSBE) or designee, typically District Structure and Bridge Safety Inspection Engineer (DSBSIE), shall follow the procedures outlined in Table 1 on the following page for notifying entities of their inspection responsibilities within their respective District.

Railroad Structures – District/Consultant

To obtain railroad right of entry agreements, coordination shall be made with the Virginia Department of Transportation, Right of Way and Utilities Division, Rail Section. Advanced coordination should be initiated typically three to six months prior to the inspection due date. Inspectors shall have railroad safety training that would satisfy the respective Railroad (RR) where required. Inspection of the bridge shall be performed after obtaining the Right of Entry Agreement (ROE) and scheduling flagging services with the respective RR.

Clearance measurements (horizontal and vertical) are required to be taken at each inspection.

Table 1 – Procedures for Notifying Entities for Inspections Due			
	Reason for Notification	When to Notify	Distribution
1.	Inspection Schedule	6 months in advance of inspections due	NOTIFY • Official directly responsible for the inspection program in the entity
2.	Follow Up for Inspections Due in Previous Month	Monthly – for inspections 1 day or more past the month due	NOTIFY • Official directly responsible for the inspection program in the entity to determine the status inspections due in the previous month (has it been inspected, when will it be inspected if it has not been inspected) COPY • Central Office Structure and Bridge Safety Inspection Program Manager • Official in the highest authority in the entity being notified.
3.	Follow Up for Past Due Inspections	Monthly – for inspections 31 days or more past the month due	NOTIFY • Official directly responsible for the inspection program in the entity COPY • VDOT's Local Assistance Division and the local liaison in the District • Central Office Structure and Bridge Safety Inspection Program Manager • Official in the highest authority in the entity being notified.
4.	Subsequent Follow Up for Past Due Inspections	Monthly – for inspections 61 days or more past the month due	NOTIFY • VDOT's Local Assistance Division and the local liaison in the District COPY • Central Office Structure and Bridge Safety Inspection Program Manager • Assistant State Structure and Bridge Engineer for Bridge Safety Inspection • Official in the highest authority in the entity being notified. • Official directly responsible for the inspection program in the entity

Notification procedures for load ratings and inventory discrepancies shall be similar to Table When these submissions are not in accordance with the time limits set forth in the NBIS or this memorandum, the District Structure and Bridge Engineer shall notify the entity in accordance with Step 3, 'Follow Up for Past Due Inspections', outlined above and, if necessary, follow up with Step 4, 'Subsequent Follow Up for Past Due Inspections'.

Entities

Each entity shall maintain an organization that will inspect, or cause to be inspected, all structures defined in this memorandum as NBI that are owned or maintained by the entity. Each entity shall have overall responsibility for compliance with the NBIS and applicable VDOT requirements of all NBI structures within their respective jurisdiction.

The NBIS requires VDOT to maintain the structure inventory system of all public roads maintained by public entities that are within Virginia's boundaries. In order to maintain this information each entity must submit all NBIS required information, to include structural inventory and appraisal data, inspection reports following VDOT format, and load ratings following VDOT Summary Format to VDOT in accordance with the policies and procedures set forth in the NBIS and this memorandum. Additionally, for all NBI structures on the National Highway System (NHS), entities shall conduct element inspections and submit all element data to VDOT for entry into the Department's Bridge Management System (BrM). Upon request, copies of the Inspection Summary Report and structure inventory sheets will be provided to the entity when the inspection schedule is transmitted.

Although the NBIS does not require Non-NBI structures to be inspected, entities are strongly encouraged to inspect their Non-NBI structures at a level and frequency equal to those set forth in this memorandum.

FREQUENCY OF INSPECTIONS:

All NBI structures and VDOT maintained Non-NBI structures shall receive inspections at the frequency indicated in Table 2, on the following page. The District/Entity shall use engineering judgment to inspect the structure more frequently as conditions warrant.

Every effort shall be made to inspect each structure in the month the inspection is due. If a structure becomes past due, immediate action shall be taken to inspect the structure and the reason for the inspection being past due documented. As soon as it is known that an inspection is expected not to be performed within the month due, the reasons for the late inspection must be submitted to the Central Office for notification of the FHWA to be considered for an inspection waiver.

Inspections not performed within the month due shall be reported, by the responsible team leaders for VDOT or by the official directly responsible for the inspection within entities, immediately to the District Structure and Bridge Safety Inspection Engineer (DSBSIE) to assure that appropriate documentation, including the structure information, reason for the late inspection and the inspection schedule is gathered and submitted to the Central Office Structure and Bridge Division. A copy of the reason for the late inspection shall also be included in the inspection folder.

When construction and/or maintenance activities cause a change to the NBI general condition rating(s), vertical clearance or posted restrictions, the structure must be re-inspected and the changes are required to be made within 30 days after construction has been completed or within 30 days of becoming aware of a possible change. Generally, maintenance work which is considered preventative or restorative (i.e. deck patching, deck overlays, painting, repairing expansion joints, crack repairs...etc.) can be documented by conducting a nonscheduled inspection that will not change the NBI next inspection date.

Table 2 – Frequency of Inspections

FREQUENCY	NBI	NON-NBI
12 months	Redundant pin and hanger assemblies with evidence of problems such as frozen hanger bars or other questionable conditions	Redundant pin and hanger assemblies with evidence of problems such as frozen hanger bars or other questionable conditions
	Non-redundant pin and hanger assemblies	Non-redundant pin and hanger assemblies
	Structures that have a restricted weight limit ⁽²⁾	Structures that have a restricted weight limit ⁽²⁾
	Structures having a general condition rating of '4' or less on one or more of the following: Deck; Superstructure; Substructure; Culvert ⁽¹⁾	Structures having a general condition rating of '4' or less on one or more of the following: Deck; Superstructure; Substructure; Culvert ⁽¹⁾
	Fracture Critical Bridges ⁽¹⁾	Fracture Critical Bridges ⁽¹⁾
24 months	Redundant pin and hanger assemblies except as noted above	Redundant pin and hanger assemblies except as noted above
	Bridges and culverts except as noted above	Bridges, except as noted above ⁽³⁾ , and Culverts with a general condition rating of '5'
48 months	Not applicable	Culverts, except as noted above
60 months	Underwater inspections of bridges and culverts	Underwater inspections of bridges and culverts
See footnote ⁽⁴⁾	Complex bridges	Not applicable

- (1) Only the bridge component(s) (deck, superstructure and/or substructure) which has the general condition rating of '4' or less, and the fracture critical members and connections need to be inspected at the interim inspection frequency of 12 months. However, if the culvert component or 2 or more bridge components for a given structure have a general condition rating of '4' or less, the regular inspection frequency for the entire structure shall be 12 months. Fracture Critical Cross Girder Box Beams that can be entered and inspected from the interior may be inspected every 12 months alternating between interior and exterior inspections to comprise an overall frequency not to exceed 24 months (as approved by the DSBE or designee). These members are also sometimes referred to as straddle bents, integral caps or integral straddle bents.
- (2) Restricted weight limits include both Field Posted and 45T structures (as defined in IIM-S&B-86). Field Posted structures for legal loads and 45T structures with general condition ratings of '6' or above are not required to be on a 12 month inspection frequency as approved by the DSBE or designee. The inspection frequency for 45T structures which are concrete and where the reinforcing details are unknown may be changed to 24 months if the structure shows no signs of structural distress. Only the component(s) which causes the weight restriction needs to be inspected at the interim inspection frequency of 12 months.
- (3) The inspection frequency for footbridges, except swing spans, may be changed to 48 months if all components have general condition rating of '6' or above.
- (4) Complex bridges shall receive an in-depth inspection at the level and frequency detailed in the complex bridge list/procedure. Movable bridges and their inspections are described in detail in the AASHTO "Movable Bridge Inspection, Evaluation and Maintenance Manual".

Clearances

Vertical and lateral clearance restrictions for roadways on and under each NBI structure and each VDOT maintained Non-NBI structure shall be checked during each regular inspection of the structure.

Non-NBI structures owned and maintained by non-VDOT entities which create vertical and lateral clearance restrictions to a roadway maintained by VDOT shall have their vertical and lateral clearances checked at intervals not to exceed 24 months. These structures will typically be under records in the Bridge Management System (BrM).

Closed Structures

Closed structures, not undergoing construction or maintenance activities, will need to be visited by the appropriate VDOT personnel or local entity at intervals not to exceed 24 months to assure the barricades and signage are still functioning as intended and the structure does not pose a risk to the public. Approach photographs (with date stamp included) showing barricades should be taken and included in the bridge file. These inspections shall be documented in the bridge record and should note which VDOT entity performed the inspection. Documentation can be a memo to the bridge file or notes in the Bridge Management System (BrM). Photos should be placed in the bridge file.

LEVEL OF INSPECTIONS AND SPECIAL CATEGORY INSPECTIONS:

All NBI structures and VDOT maintained Non-NBI structures shall receive inspections at the same level as defined by the NBIS requirements, MBE, and this document. Element Inspections are required for all VDOT maintained NBI and Non-NBI structures except temporary structures, pedestrian and foot bridges, pier or dock structures and under records. Routine inspection techniques shall be sufficient to quantify the condition and remaining section of structural components. Routine inspections are primarily visual and tactile (i.e. probing, measuring, sounding, etc.) in nature; however, these inspections may include cleaning sheet corrosion in key locations that influence load carrying capacity, dye penetrant testing and/or magnetic particle testing to verify cracking in steel members, removing concrete delamination at isolated locations over traffic and/or removing debris as needed to access the element, etc.

For each routine inspection and special category inspection noted below, the report shall document the results of the inspection using notes, sketches and/or photographs. At each subsequent inspection, an on-site comparison with the previously reported conditions is to be made and documented. As a result of these routine and special category inspections, any critical findings and urgent repairs shall be brought to the attention of the District Structure and Bridge Engineer or designee or the local Entity in an expeditious manner within a timeframe not to exceed 24 hours. If warranted, a critical recommendation shall be issued. Emergency findings shall be reported immediately by the Team Leader while on-site. Contact will normally be initiated by telephone and followed up the same day with email documentation of the findings, including photographs. Once contacted, the District Structure & Bridge Engineer or designee will work with the Team Leader to quantify and assess the situation to determine if it warrants an emergency response or can be addressed through the critical recommendation process.

Pin (or pinned) Connections

During each scheduled inspection of the pin and hanger assembly, each pin assembly shall receive a hands-on inspection and each pin shall receive ultrasonic testing. Where practical, ultrasonic testing of each pin shall be performed from both ends of the pin. A statement about the condition of each pin or groups of pins shall be entered in the inspection report regardless of condition. Separate ultrasonic testing documentation shall be kept in the bridge file and may be included in the inspection report as optional supporting documentation.

Other types of pin connections that will require ultrasonic testing may exist on structures including details such as truss pins, girder pin connections, superstructure to substructure pin connections, etc. The District Structure and Bridge Engineer, or their designee, shall determine the need for this additional level and frequency of testing for these pin connections.

Fatigue Prone Details

Fatigue prone details shall receive a hands-on inspection of fatigue prone categories D, E, and E' details during each inspection. Category C or C' details shall receive a close-up inspection during each inspection. Additionally, other areas that may cause stress concentrations (i.e. out of plane distortion, traffic impacts, copings, field welds, flame cut surfaces, etc.) shall be evaluated and classified as fatigue prone (as applicable) and receive a hands-on or close-up inspection as determined by the District Structure and Bridge Engineer or designee. Bridge records are to include sketches showing category type and location of fatigue prone details and any specific areas that are to be inspected. Inspection reports shall note the fatigue prone details and locations and a statement regarding the method of access used during the inspection. A statement about the condition of each fatigue prone detail or group of details shall be entered in the inspection report regardless of their condition.

Fracture Critical Members

Fracture critical members and their connections (including gusset plates) are to receive a hands-on inspection during each inspection as required. The fracture critical member (FCM) inspection uses visual methods that may be supplemented by NDT for verification and quantification of visual indications. A very detailed visual hands-on inspection is the primary method of detecting cracks. This may require that critical areas be specially cleaned prior to the inspection and additional lighting and magnification be used. NDT methods may be required for verification and documentation of visual indications and shall be used at the discretion of the Team Leader. Note that it is not acceptable documentation to report a possible crack or to report a visual indication without conclusive determination and quantification of the field condition. Bridge records are to include sketches showing the type and location of fracture critical members or details and any specific areas that are to be inspected. Inspection reports shall note the fracture critical members or details and locations and a statement regarding the method of access used during the inspection. A statement about the condition of each fracture critical member or detail or group of details shall be entered in the inspection report regardless of their condition.

Similar to crack verification in steel members, if an inspection finds areas on fracture critical members or their connections (including gusset plates) where corrosion is evident and section loss cannot be quantified or determined by visual and tactile methods, an appropriate non-destructive evaluation technology shall be used to assess the condition and quantify the remaining thickness.

Complex Bridges

Complex bridges are to receive an in-depth inspection in accordance with the complex bridge list/procedure. Bridge records are to include appropriate documentation for any specific details that are to receive in-depth inspection including method of access for the specific location(s).

INSPECTION AND INVENTORY REQUIREMENTS

Determining Structure Numbers (State)

This section may be used as a guide to create new Virginia Structure Numbers. When a structure record is created, the Virginia structure number is typically given to a structure based upon which highway system the bridge is located. The following series can be used to create the Virginia Structure Number: For city/county line structures, a 9 should be placed in the second digit of the above series (except for the 100-999 and the 1800 series).

SERIES	EXPLANATION
100-999	Structures in PE or construction phases, structure number was required for billing purposes, no traffic on structure and not replacing an existing structure
1000 – 1999	Primary system (excludes the 1800 series)
1800 – 1899	VDOT maintained in a municipality
2000 – 2999	Interstate system
5000 – 5999	Pedestrian bridges that cross a roadway
6000 – 6999	Secondary system
8000 – 8999	Municipality maintained
9000 – 9999	Footbridges that do not cross a roadway

Note there will be exceptions to this guidance and not all Districts will have historically followed the table above. However, for statewide consistency, it is recommended.

New 4-digit Virginia Structure Numbers are assigned by the District Structure & Bridge Engineer or designee. The Virginia Structure Number shall be unique to the county and should be validated to assure no duplication in the inventory for structures open to traffic.

Virginia Structure Numbers for new bridges on a new alignment shall be unique within the county. For replacement structures on the same or similar alignment the existing Virginia Structure Number can be reused. If a replacement structure has the same 4-digit Virginia Structure Number within the same county, but is not yet open to traffic as coded in the inventory (i.e. 'G'), then this is valid and is not considered a duplication.

Three digit temporary structure numbers for new structures not yet open to traffic are optional at the District's discretion.

New Structure Numbers (Federal)

The Central Office is responsible for assigning new Federal Structure Numbers and will require the following minimum information from the Districts as part of that process: District, County, route number of roadway carried, feature intersected, maintenance responsibility, and plan number (if known at time of request).

New Federal Structure Numbers are required for new structures on new alignments and total replacement structures on existing alignments. This includes replacement culverts that meet the definition of Large Culvert. Typically for replacement structures, if portions of the old structure remain in the new work (can be superstructure and/or substructure elements), the structure is not considered new but rather reconstructed and a new Federal Structure Number is not required.

Inspections

Prior to opening to traffic, all new and rehabilitated structures, including the constructed portion(s) of each phase of construction where applicable, will be inspected. These inspections can coincide with the final or punch-list inspection coordinated with the Construction Division. The Area Construction Engineer or designee shall contact the District Structure and Bridge Engineer or designee to request the inspections.

Construction work resulting in a rehabilitated structure (i.e. deck / superstructure replacement, widening, etc.) should be documented by conducting a regular inspection that will change the NBI next inspection date.

Each inspection shall include a review of all structure inventory items and element data. Discrepancies shall be corrected. Inventory data sheets are available for taking hard copies into the field for verification.

Apart from the exception noted below, an inspection team will be composed of no fewer than two people when performing inspections of any structure. The team is to be comprised of a Team Leader (or Senior Inspector) and a Team Member and in some cases due to varying conditions additional Team Members could be warranted. Given the nature of the work, two people on-site enable the members to monitor each other's safety and call for assistance if something were to happen to the other Team Member. In certain circumstances and with the approval of the District Structure & Bridge Safety Inspection Engineer, Team Leaders (or Senior Inspectors) may perform inspections as needed without assistance from a Team Member. Assistance from other sections' personnel is encouraged for safety and physical activities during the inspection if a Team Member is not available. In these instances, all VDOT health and safety regulations and work zone protection standards of practice shall be observed and safety of the Team Leader or traveling public shall not be compromised. Although it is not anticipated that this will be a common occurrence, it may be warranted on a case by case basis.

An inventory 'on' record and an 'under' record (if necessary) shall be created for all structures that require an inspection in accordance with this document, the NBIS, and the FHWA Recording and Coding Guide for the Structure Inventory and Appraisal of the Nation's Bridges.

Additionally, an inventory 'under' record shall be created by VDOT for Non-NBI structures owned and maintained by Non-VDOT entities which create vertical and lateral clearance restrictions to a roadway maintained by VDOT (including pedestrian and foot bridges). The term 'inspection' in these records will refer to, at a minimum, the clearance checks performed and a review of the required inventory data.

Quality control (QC) and quality assurance (QA) procedures, including qualifications of inspection personnel, shall be in accordance with the current IIM-S&B-78, Subject: Bridge Safety Inspection QC/QA Program.

Report Requirements

Bridge safety inspection reports shall include the following:

- Actual inspection date(s) shall be recorded.
- For inspections that overlap in months, the NBI inspection date should be documented as the first or last date.
- Unless otherwise approved by the DSBSIE, new photographs shall be required during each inspection. Old photos can be included for comparison or to show a better picture of a condition (i.e. such as the substructure when the water level was much lower during a past inspection).
- All photographs shall include the date stamp.
- Ambient weather conditions shall be recorded (i.e. clear and sunny 78 degrees).
- Access equipment and type of Maintenance of Traffic (MOT) shall be noted in the inspection report.
- Special testing equipment used during the inspection shall be noted.
- Special considerations for contacts, access, right of entries and/or other restrictions shall be noted.
- List other persons present during the inspection such as MOT crew, RR Flagger, QA Reviewer, Special Access operator....etc.

All inspections of VDOT maintained structures shall be documented using VDOT's most current electronic safety inspection report form (SB540). Entities are strongly encouraged to use VDOT's most current electronic safety inspection report form for Entities (SB541). Entities may use a different safety inspection report form; however, the contents must, at a minimum, meet FHWA and VDOT guidelines. Reports submitted by Entities shall include both printed and electronic copies.

For general condition ratings of '7' or less, detailed comments supporting these ratings must be included in the report. In addition to detailed comments, photos, sketches and tables may also be needed for deficiency clarification. Current photographs shall be included in the report of all items which warrant a general condition rating of '4' or less.

Any item which shows a change in condition since the previous inspection will be marked to indicate a change since the previous inspection. The method of marking these changes will be clearly noted in the 'Miscellaneous' section of the report. When interim and nonscheduled inspections are performed, the reason for this type of inspection shall be documented in the 'Miscellaneous' section of the report.

Vertical clearances will be documented on a sketch. This sketch will show the minimum vertical clearance for each lane and include the minimum vertical clearance for a ten-foot width of pavement where the clearance is greatest (Federal Item 10). For paved roadways, measurements will be limited to travel lanes and improved shoulders between edges of pavement and only be taken between lateral restrictions (i.e. guardrail, barriers, etc.).

Repair recommendations are to be listed in priority order with the highest priorities listed first. Cost estimates for these repair recommendations are not required.

For bridges having a non-integral wearing surface, the average thickness and nature of the overlay material shall be recorded in the 'Wearing Surface' section of the inspection report. If the wearing surface thickness is not able to be field verified or cannot be taken from bridge plans, a reasonable estimate based on the judgment of the inspector may be used until more accurate measurements can be obtained. If a non-integral wearing surface is not present, the nature of the integral wearing surface shall be recorded under the 'Deck' section of the report and 'None' or 'N/A' shall be recorded in the 'Wearing Surface' section.

The 'Object Marker' section of the inspection report shall note the presence and condition of object markers and other safety features at structures.

The 'Field Posting' section of the inspection report shall note the presence, details of the restriction and condition of any signs indicating weight restrictions, vertical restrictions, or horizontal restrictions. This includes, but is not limited to signs indicating vertical restrictions, narrow bridge, one lane bridge and load postings.

The results of the latest underwater inspection shall be considered when assigning the substructure general condition ratings, and the inspection reports shall contain a statement indicating that these results were considered. The latest underwater inspection report may optionally be attached to the inspection report. If the underwater inspection findings adversely influence the substructure rating or provide additional pertinent information not accessible to the Team Leader, a brief summary of these findings shall be included in the 'Substructure' section of the report.

Structure inventory and appraisal sheets may optionally be included in the inspection report. These inventory sheets shall be reviewed during the inspection and submitted along with the inspection report. A statement should be in the inspection report that the inventory was checked or reviewed. The statement should also include any changes that were made to the inventory.

Additional report requirements may be found in the 'Scour and Stream Channel Documentation' and 'Load Rating Analysis' sections.

Updating Inventory Data

The inventory information for all structures shall be updated in accordance with the NBIS.

The inspection report and all inventory data for new, rehabilitated and repaired structures shall be entered into the inventory database within 90 days of opening the structure to traffic for VDOT and within 180 days for Entities.

For changes in load rating due to initial or changed conditions the capacity rating shall be in accordance with the current IIM-S&B-86, Subject: Load Rating and Posting Structures (Bridges and Culverts).

Structures that have been closed to traffic shall have the closure indicated in the inventory upon notification that the closure has taken place.

Structures that have temporary conditions including vertical or horizontal clearances, temporary shoring or temporary structures shall be indicated in the inventory.

INSPECTION FORMS AND DISTRIBUTION:

In addition to the repair recommendations on the bridge safety inspection report for VDOT structures, the District Structure and Bridge Section shall utilize a standard method for notifying other responsible managers of preventive and ordinary maintenance needs. To assist in facilitating this notification, the Structure Preventive Maintenance Form (SB504) may be used. For information purposes a copy of this form has been included in the 'Attachments' section of this document.

Copies of all inspection reports are to be placed on the State Structure and Bridge Safety Inspection Team Site within 90 days after the inspection is performed. For VDOT maintained structures, the District Structure and Bridge Section shall send monthly notifications to the responsible Maintenance Manager of completed inspection reports placed on the team site. Each entity should have a similar process, as noted above, to ensure that each structure's maintenance needs are considered and addressed as appropriate.

District Structure and Bridge Sections and Entities shall maintain a bridge record of each structure within their jurisdiction in accordance with the NBIS, including, but not limited to, the official signed structure inspection reports, damage reports, strengthening, repairs, load rating analysis and capacity data, scour analysis, scour critical plans of action, critical recommendations and related correspondence until the structure is demolished. Once a structure is demolished, the inspection records may be disposed of in accordance with the current records retention policy of each respective organization.

All bridge safety inspection reports are designated Critical Infrastructure Information (CII). This designation identifies information that is not appropriate for public release. Printed copies of the inspection reports shall be protected at all times. Each person who works with protected documents is personally responsible for taking proper precautions to ensure unauthorized persons do not gain access to the reports. Anyone requesting copies of bridge safety inspection reports should be referred to the District Structure and Bridge Section. District Structure and Bridge Engineers/Entities may release inspection reports of structures within their respective jurisdiction to individuals or parties that have a legitimate business need-to-know in accordance with the latest CII guidelines. Such cases require those non-VDOT individuals or parties to submit a completed and signed 'Multi-Purpose Non-Disclosure Agreement' form to the appropriate District Structure and Bridge Engineer. For information purposes, a copy of this agreement has been included in the 'Attachments' section of this document and the electronic file is available upon request.

CRITICAL RECOMMENDATIONS:

Critical recommendation forms shall be used to notify the responsible manager of conditions identified as posing a threat to public safety. Critical recommendations can be an emergency condition posing an immediate safety risk or hazard to the structure's integrity and/or traveling public or an imminent condition that could, if left unresolved, result in localized failure of the structure or present a safety issue to the traveling public. Critical recommendations that are considered emergency conditions should be addressed immediately or not to exceed 30 days and those that are imminent conditions should be addressed not to exceed 90 days from date of discovery. Others which will require processing through a formal project shall have a monitoring process in place until work is complete and the critical should be closed out.

Conditions requiring the issuance of a critical recommendation form include, but are not limited to:

1. Critical repairs to fracture critical members.
2. Correction of critical scour and/or hydraulic induced problems.
3. General condition rating lowered to a '3' or less for deck, superstructure, substructure or culvert.
4. Immediate work to prevent substantial reduction in a structure's load capacity.

The critical recommendation form will identify the problem and provide an action to be taken, including a cost estimate and a time frame for the action to be completed. Possible actions may include, but should not be limited to, immediate repair, posting the structure, closing the structure, inspecting the structure more frequently, performing a structural analysis and/or removing traffic from the affected members.

Upon completion of the follow-up inspection, a copy of the critical recommendation form shall be included in the bridge record.

The District Structure and Bridge Safety Inspection Engineer will be responsible for assuring that a critical recommendation form is created and updated on the Critical Recommendation Team Site for all stages of the process.

VDOT

Upon learning of the need for a critical recommendation to be issued, the District Structure and Bridge Engineer or their designee shall notify the District Bridge Maintenance Manager or the responsible manager in the most expeditious manner available. The Critical Recommendation Form (SB500) will be prepared and transmitted to the responsible manager using the Critical Recommendation Team Site and in accordance with the guidelines therein. For information purposes a copy of this form has been included in the 'Attachments' section of this document.

The subsequent corrective action by the responsible manager and follow-up inspection by the District Structure and Bridge Section shall be documented in the electronic critical recommendation form on the Critical Recommendation Team Site. The follow-up inspection shall be completed within 10 working days upon notification that the corrective action is completed.

Entities

Entities shall use a process similar to that of VDOT for addressing critical findings in accordance with the requirements of the NBIS. A Non-VDOT Critical Recommendation Form (SB501) may be used to notify the responsible manager and document the critical finding. For information purposes a copy of this form has been included in the 'Attachments' section of this document and the electronic template is available upon request.

A copy of the initial notice and a copy of the form noting that the follow-up inspection has been completed shall be promptly provided to the District Structure and Bridge Engineer.

District Structure and Bridge Engineers or their designee shall monitor inspection reports from Entities to identify conditions that may warrant the issuance of a critical recommendation form. If a condition is identified as requiring a critical recommendation form, the District Structure and Bridge Engineer or their designee shall:

1. Contact the responsible official for the Entity and inquire about the status of the remedial work on the structure.
2. Emphasize to the responsible official the importance of prompt corrective action.
3. If the Entity's actions are unacceptable, written notification shall be made detailing VDOT's concerns. The District Administrator or appointed representative should sign the written notice. Copies of all correspondence shall be sent to the State Structure and Bridge Engineer and the Central Office Bridge Safety Inspection Program Manager.

The Central Office Structure and Bridge Division will provide assistance as requested by the District after the District has exhausted the remedial actions above.

SCOUR AND STREAM CHANNEL DOCUMENTATION:

The vulnerability of a bridge to scour (Federal Item 113) shall be initially determined through analysis by a hydraulic/geotechnical/structural engineer and/or the design engineer of record.

The lead inspector shall review Federal Item 113 as a part of each inspection to determine if field conditions warrant a change. All changes to Federal Item 113 will be coordinated with the District Structure and Bridge Engineer or designee and/or the District Hydraulics Section prior to making changes to the inventory database.

All scour critical bridges shall be monitored in accordance with their respective plan of action (POA) as applicable. During the inspection of a scour critical bridge, the POA for the structure will be reviewed and updated as necessary. For information purposes a copy of this form has been included in the 'Attachments' section of this document and the electronic template is available upon request.

Channel Cross Section at Fascias

For every structure that crosses a waterway, a channel cross section shall be made along the upstream or downstream fascia of the structure using readings as described in the following paragraph. Channel cross sections along both fascias shall be provided when warranted by field conditions such as channel alignment issues and streambed degradation. Channel cross sections are to be recorded during the initial inspection of each structure. At each regular

inspection, current readings are to be taken and compared to the previously recorded cross sections(s) to determine if significant changes have occurred. At a minimum, the latest, initial and previously recorded streambed cross section elevations shall all be recorded on the same sketch for comparison purposes. If the cross section has not changed, a comment that the cross section was checked is to be added to the inspection report and the channel cross section sketch indicating the date(s) that it was checked.

Readings are vertical measurements taken from a fixed reference line to the streambed or floodplain, and are used to develop a channel cross section between the two substructure abutments. Readings shall be taken along the fascia(s) starting at the substructure unit before the floodplain and ending at the substructure unit beyond the end of the floodplain at intervals sufficient to show a cross section elevation that is representative of the streambed and floodplain. If readings were previously taken, new readings shall be taken at the same intervals from the same reference line. Additional readings shall be taken at locations where obvious changes in the streambed or floodplain are evident to provide an updated elevation. Readings shall be recorded in a fashion similar to that shown on the Sample Channel Cross Section sketch in the 'Attachments' section of this document.

For structures that require an underwater inspection, the lead inspector shall evaluate the existing stream channel and scour conditions during each inspection to the extent that this can be accomplished without diving. If no changes can be observed from the latest underwater inspection report, this will be noted, along with the date of the referenced underwater inspection. If significant changes are detected, normal documentation will be used to the extent possible and the District Structure and Bridge Engineer or designee shall be notified by the lead inspector in the most expeditious manner of the need for an underwater inspection.

Cross section elevation readings and sketches produced during underwater inspections shall be referenced to a common point with readings taken from the above water inspections to establish continuity between the two inspections in referencing the same channel bed elevations.

Channel Profile at Substructure Units

Channel profiles around the perimeter of the substructure units are required whenever the inspection of the substructure unit reveals scour and/or undermining that affects or may affect the structural integrity of the substructure unit. The channel profile at a substructure unit must be documented relative to fixed points on the substructure, such as the top of footing, beam seats, top of pier caps, and readings shall be taken along the face of the substructure unit at intervals necessary to properly indicate the severity of the scour and/or undermining. For undermining, these readings shall quantify the height, length and depth back under the substructure unit.

Stream Alignment Sketch

Stream alignment sketches are used to show the stream alignment relative to the bridge opening and quantify the extent and severity of any existing channel migration, scour, erosion and/or sedimentation. Stream alignment sketches shall be shown in a plan view.

Stream alignment sketches shall be included in the inspection reports for bridges where erosion problems are identified that may affect the structural integrity of one or more substructure units. Additionally, stream alignment sketches shall be used to document any deficiencies in the stream channel that cannot be adequately shown in a photograph.

LOAD RATING ANALYSIS:

Load Ratings shall be performed in accordance with the current IIM-S&B-86, Subject: Load Rating and Posting Structures (Bridges and Culverts). Structural analyses are to be part of each structure's bridge record and will have a completed 'Load Rating Summary Form for Structures' attached to each regular inspection report.

The deterioration levels and rating assumptions are to be reviewed as part of each scheduled inspection. A statement shall be placed in the structural analysis section of the inspection report stating that the rating has been reviewed with respect to the current condition.

When a superstructure GCR changes to a 4 or less, a new load rating is required. Other changes to the GCR for deck, superstructure and substructure shall be reviewed to determine if a new load rating is warranted. Any condition that may affect safe load carrying capacity shall be evaluated to determine if a new load rating analysis is warranted.

STRUCTURE RESTRICTION AND POSTING:

Reduction of weight limits on any structure shall be in accordance with the Code of Virginia - Title 46.2, Chapter 10 and current IIM-S&B-86.

Restricted weight limit signs when required, shall be erected in accordance with the latest version of the Virginia Supplement to the Manual of Uniform Traffic Control Devices (MUTCD), Part 2 – Signs, Section 2B.59.

Overhead structures or parts of structures having an actual vertical clearance less than or equal to 14'-5" shall be signed in accordance with the latest version of the Virginia Supplement to the MUTCD, Part 2 – Signs, Section 2C.27.

Should the inspection find that restrictive signs are not in compliance with the Virginia Supplement to the MUTCD, Part 2 – Signs, a form similar to the attached Bridge Signage Form (SB503) shall be used to alert the local Residency for secondary routes and the Regional Traffic Operations Centers for primary routes. This notification shall be made in an expeditious manner upon completion of the field inspection. New or replacement signs shall be erected as soon as fabrication permits and generally within 30 days of the notification. If the completed Bridge Signage Form is not returned to Structure & Bridge Division within 30 days, then the District Structure and Bridge Engineer or designee/Entity shall follow-up on the status of the signage. For information purposes a copy of this form has been included in the 'Attachments' section of this document.

CC: Chief Engineer
Division Administrators under the Deputy Chief Engineer
Local Assistance Division Director
District Administrators
District Maintenance Engineers
District Construction Engineers
Assistant State Structure and Bridge Engineers
District Structure and Bridge Engineers
District Bridge Safety Inspection Engineers
District Bridge Maintenance Managers
Residency Administrators
Regional Traffic Operations Centers
Federal Highway Administration

ATTACHMENTS

Structure Preventative Maintenance Form – Form SB504

Critical Infrastructure Information/Sensitive Security Information (CII/SSI) – Multi-Purpose Non-Disclosure Agreement

Critical Recommendation Form – Form SB500

Non-VDOT Critical Recommendation Form – Form SB501

Sample Channel Cross Section

Bridge Signage Form – Form SB503

Scour Critical Plan of Action Template

Typical Fatigue Prone Details



Structure and Bridge

**INTRA-DEPARTMENTAL MEMORANDUM
Structure Preventive Maintenance Form**

City/County: _____
Route: _____ **Over:** _____
Structure No.: _____

Inspected By: _____
Inspection Date: _____

To: _____ **From:** _____ **Date:** _____
 District Bridge Maintenance Manager District Structure & Bridge Engineer

Inspection by the District Bridge Safety Inspection Team has revealed that the reference bridge requires preventive maintenance. These items, with cost estimates are as follows:

	Approximate Cost	Date Work Performed	Performed By
Seal Expansion Joints	<input type="checkbox"/> _____	_____	_____
Clean Deck	<input type="checkbox"/> _____	_____	_____
Clean Abutment Seats	<input type="checkbox"/> _____	_____	_____
Clean Pier Seats	<input type="checkbox"/> _____	_____	_____
Clean Bearings	<input type="checkbox"/> _____	_____	_____
Clean Truss Panel Points	<input type="checkbox"/> _____	_____	_____
Clear Debris from Scuppers	<input type="checkbox"/> _____	_____	_____
Clean Other (Identify)	<input type="checkbox"/> _____	_____	_____

* Clear Debris (Identify)	<input type="checkbox"/> _____	_____	_____

Other (Identify)	<input type="checkbox"/> _____	_____	_____

* May include removing silt from boxes/culverts/pipes, or removing debris between steel beams or at piers

The above deficiencies were corrected on the dates indicated above.

Signature: _____
 District Bridge Maintenance Manager

Once the deficiency is corrected, please forward the original of this form to the District Structure & Bridge Engineer and copy the District Structure & Bridge Safety Inspection Engineer.



Critical Infrastructure Information/Sensitive Security Information (CII/SSI) Multi-Purpose Non-Disclosure Agreement

Retain a copy of both the front and back sides of this form for future reference

VDOT requires CII/SSI be protected and not disclosed to unauthorized persons.

PART A: To Be Completed By Individual VDOT or Company Employee

I agree with the following as a condition of being granted access to CII/SSI:

CII/SSI, which is valuable and sensitive, is protected by law and by strict VDOT policies. The intent of these laws and policies is to assure that CII/SSI will remain confidential - that is, it will be used only as necessary to accomplish VDOT's mission. Disclosure of CII/SSI in any manner that permits interception by unauthorized persons could compromise safety and security and is prohibited. CII/SSI may be released only to persons with a need-to-know.

I might have access to this information in various formats including but not limited to documents and drawings, physical structures, and computer based systems. I have no right or ownership interest in any VDOT CII/SSI. VDOT may at any time revoke my authorization allowing access to CII/SSI.

Willful violation of this agreement may subject me to discipline which might include, but is not limited to, removal from current VDOT projects;

exclusion from further VDOT related work; and legal liability. My obligations with respect to the confidentiality and security of all CII/SSI disclosed to me shall survive the termination of any agreement or relationship with VDOT. My execution of this agreement shall not nullify or affect in any manner any other agreement, non-disclosure or otherwise, which I have executed or may execute with VDOT or the Commonwealth of Virginia.

I am obligated to protect this information from unauthorized disclosure in accordance with the terms of this agreement. I will only use CII/SSI that I obtain to perform my legitimate VDOT related duties. I will conduct myself in a strict conformance to applicable laws and VDOT policies governing CII/SSI. I will safeguard the confidentiality of all CII/SSI at all times. I will be responsible for my misuse or my wrongful disclosure of CII/SSI.

Each provision of this agreement is severable. If any administrative or judicial tribunal should find any provision of this agreement to be unenforceable, all other provisions shall remain in full force and effect.

I make this agreement in good faith, without mental reservation or purpose of evasion.

_____ Printed Name	_____ Date
_____ VDOT District/Division OR Company Name	_____ Phone Number
_____ Company Address	
_____ Signature	_____ Signature of Authorized Agent (Not required for VDOT employees)

PART B: To Be Completed By Company Agent

Only: In addition to the provisions above, I certify:

All employees of this company involved with this VDOT project, regardless of location, who will have access to CII/SSI, myself included, will complete Part A of the Critical Infrastructure Information/Sensitive Security Information Multi-Purpose Non-Disclosure Agreement. The Agreement will be signed by me and accepted by VDOT prior to being granted access to CII/SSI. We will only access CII/SSI for which we have a need-to-know.

We will safeguard the confidentiality of all CII/SSI at all times. We will conduct ourselves in strict conformance to applicable laws and VDOT policies governing CII/SSI. Obligations with respect to the confidentiality and security of all CII/SSI disclosed to us shall survive the termination of any agreement or relationship with VDOT.

Authorized Company Agent:

_____ Signature of Authorized Agent	_____ Date
_____ Printed Name	_____ Title
_____ Company Name	_____ Phone Number
_____ Company Address	
_____ VDOT Contract Name and Number	

This form is valid for the identified project for a period of two years, while employed by the same company.



**Critical Infrastructure Information/Sensitive Security Information (CII/SSI)
Multi-Purpose Non-Disclosure Agreement**

Back Page

Retain a copy of both the front and back sides of this form for future reference.

Handling CII/SSI

You are responsible for safeguarding Critical Infrastructure Information/Sensitive Security Information (CII/SSI) in your custody or under your control.

The extent of protection afforded CII/SSI shall be sufficient to reasonably foreclose the possibility of its loss or compromise.

The terms of this clause (*Handling CII/SSI*), including this paragraph, must be included in any dissemination of any document, in whole or in part, that contains CII/SSI.

Protection - CII/SSI shall be protected at all times, either by appropriate storage or having it under the personal observation and control of a person authorized to receive it. Each person who works with protected CII/SSI is personally responsible for taking proper precautions to ensure that unauthorized persons do not gain access to it.

Use and Storage - During working hours, reasonable steps shall be taken to minimize the risks of access to CII/SSI by unauthorized personnel. After working hours, CII/SSI shall be secured in a secure container, such as a locked desk, file cabinet or facility where contract security is provided.

Reproduction - Documents or material containing CII/SSI may be reproduced to the minimum extent necessary consistent with the need to carry out official duties provided that the reproduced material is marked and protected in the same manner as the original material.

Disposal - Material containing CII/SSI shall be disposed of by any method that prevents unauthorized retrieval (e.g. shredding, burning, returning to original source, etc.).

Transmission - CII/SSI shall be transmitted only by VDOT courier, US first class, express, certified or registered mail, or through secure electronic means.



Critical Recommendation Form

for, Repair and/or Strengthening

Inspected By: _____

Inspection Date: _____

Route: _____ NBIS (Y/N) _____

Over: _____

County: _____

Str. No.: _____

Located: _____ Mi. To: _____

Mi. From: _____

WHEN A CRITICAL CONDITION IS DISCOVERED SEND FORM:

To: _____

From: _____

Date: _____

District Bridge Maintenance Manager

District Structure & Bridge
Safety Inspection Engineer

- cc: District Structure and Bridge Engineer
- District Maintenance Engineer
- State Structure and Bridge Engineer
- District Environmental Engineer

AFTER THE CRITICAL CONDITION IS REPAIRED SEND FORM:

To: _____

From: _____

Date: _____

District Structure & Bridge Safety
Inspection Engineer

District Bridge Maintenance
Manager

- cc: District Structure and Bridge Engineer
- State Structure & Bridge Engineer

Federal Structure ID No:0000000000 _____

CRITICAL CONDITION REQUIRING IMMEDIATE ATTENTION (≤ 30 days) or (≤ 90 days)

- Immediate performance of work on fracture critical member(s) is needed.
- Immediate correction of scour and/or hydraulic induced problem is needed.
- Condition rating of 3 or less for deck, superstructure, substructure and/or culvert.
- Immediate work to prevent substantial reduction in safe load capacity and/or for the safety of the traveling public.

Action required (include date work must be completed): _____

ESTIMATED COST - \$ _____

BELOW TO BE FILLED OUT BY RESIDENCY ADMINISTRATOR and/or DISTRICT BRIDGE
MAINTENANCE MANAGER WHEN WORK HAS BEEN COMPLETED

Action taken (include date work was completed): _____

Signature _____

District Bridge Maintenance Manager

Follow-up Inspection after work is complete by:

Bridge Safety Inspector Date

Municipality/Agency: _____

**Non-VDOT Critical
Recommendation Form**

for, Repair and/or Strengthening

Route: _____ NBIS (Y/N) _____
Over: _____
Str. No.: _____
Located: _____ Mi. To: _____
Mi. From: _____
Inspected By: _____ Inspection Date: _____

WHEN A CRITICAL CONDITION IS DISCOVERED SEND FORM:

To: From: _____ Date: _____
(Insert Title of Responsible Manager) District Structure and Bridge Safety
Inspection Engineer
cc: District Structure & Bridge Engineer
State Structure & Bridge Engineer

AFTER THE CRITICAL CONDITION IS REPAIRED SEND FORM:

To: _____ From: _____ Date: _____
District Structure and Bridge Safety (Insert Title of Responsible
Inspection Engineer Manager)
cc: District Structure and Bridge Engineer
State Structure & Bridge Engineer

Federal Structure ID No:0000000000 _____

CRITICAL CONDITION REQUIRING IMMEDIATE ATTENTION (≤ 30 days) or (≤ 90 days)

- Immediate performance of work on fracture critical member(s) is needed.
- Immediate correction of scour and/or hydraulic induced problem is needed.
- Condition rating of 3 or less for deck, superstructure, substructure and/or culvert.
- Immediate work to prevent substantial reduction in safe load capacity and/or for the safety of the traveling public.

Action required (include date work must be completed): _____

ESTIMATED COST - \$ _____

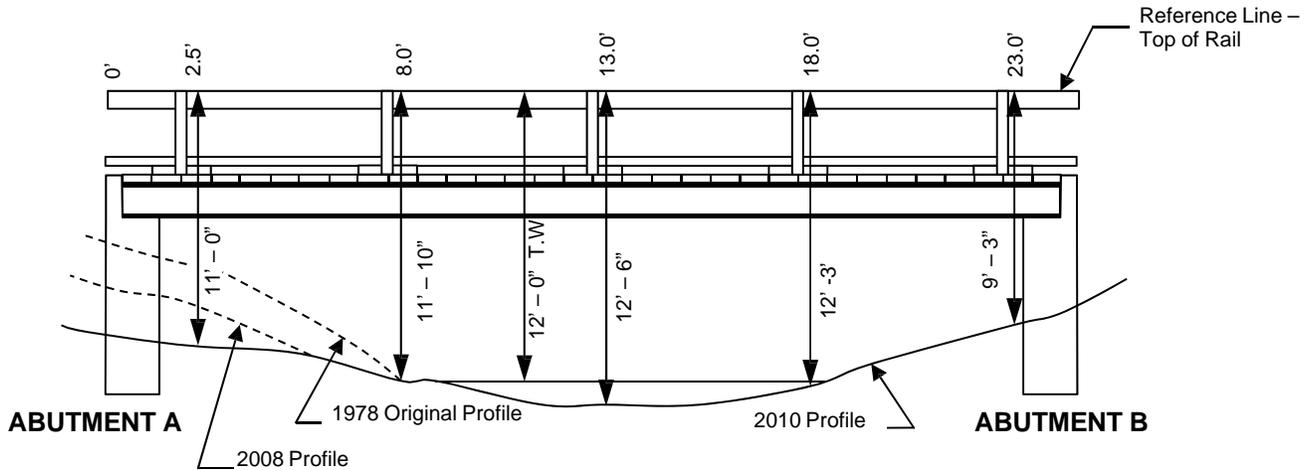
BELOW TO BE FILLED OUT BY MUNICIPALITY/AGENCY WHEN WORK HAS BEEN COMPLETED

Action taken (include date work was completed): _____

Signature _____
(Insert Title of Responsible Manager)

Follow-up Inspection after work is complete by: _____
Bridge Safety Inspector Date

SAMPLE CHANNEL CROSS SECTION



ELEVATION VIEW

Upstream Fascia
 Looking Downstream

YEAR	STATION 2.5'	STATION 8.0'	STATION 13.0'	STATION 18.0'	STATION 23.0'
1978 Original	6' - 6"	11' - 10"	12' - 6"	12' - 3"	9' - 3"
2008 Readings	8' - 6"	11' - 10"	12' - 6"	12' - 3"	9' - 3"
2010 Readings	11' - 0"	11' - 10"	12' - 6"	12' - 3"	9' - 3"

Legend: T.W. = Top of water

Structure and Bridge

INTRA-DEPARTMENTAL MEMORANDUM

Bridge Signage Form

City/County: _____
Route: _____ **Over:** _____
Structure No.: _____

To: _____ **From:** _____ **Date:** _____
(Insert Title of Responsible Manager) District Structure & Bridge Engineer

SIGNAGE AFFECTED

Weight Restriction Vertical Clearance Restriction Object Markers Other

Inspection and/or analysis by the District Structure and Bridge Section revealed that the signage for the above referenced bridge is: (check all that apply)

- | | |
|--|---|
| <input type="checkbox"/> Required and not in place. | <input type="checkbox"/> Incorrect and needs to be lowered. |
| <input type="checkbox"/> No longer required and needs to be removed. | <input type="checkbox"/> Incorrect and needs to be raised. |
| <input type="checkbox"/> Missing or damaged and needs to be replaced. | <input type="checkbox"/> Obscured |
| <input type="checkbox"/> Advance warning signs are not placed in accordance with Section 46.2-1130 of the Code of Virginia | |
| <input type="checkbox"/> Comments: _____ | |

SIGNING FOR WEIGHT RESTRICTION OF STRUCTURE shall adhere to the latest version of the Virginia Supplement to the Manual of Uniform Traffic Control Devices (MUTCD), Part 2 – Signs, Section 2B.59 and shall indicate a maximum capacity of:

_____ tons on a R12-1 sign or
_____ tons (single unit) and _____ tons (semi-trailer) on a R12-V1 sign

SIGNING FOR VERTICAL CLEARANCE OF STRUCTURE shall adhere to the latest version of the Virginia Supplement to the (MUTCD), Part 2 – Signs, Section 2C.27 and shall indicate a maximum clearance of:

_____ feet _____ inches

The above signage deficiency was corrected on the following date: _____

Signature: _____
(Insert Title of Responsible Manager)

Once the deficiency is corrected, please forward the original of this form to the District Structure & Bridge Engineer and copy the District Structure & Bridge Safety Inspection Engineer.

Scour Critical Plan of Action

Structure ID	
Federal Aid System of Highways	
FIPS County	
District	
County/City	
Carrying	
Over	
Virginia Structure Number	
Year Built	
Size of Existing Bridge	
Foundation Type	
Scheduled for Replacement	
Detour Length	
Average Daily Traffic	
Source of Scour Critical Rating	
Scour Rating (Item 113)	
Planned Actions	
Other actions	
Prepared by	
Signature	
Date	

TYPICAL FATIGUE PRONE DETAILS

Close visual inspection of fatigue prone details is required. Concentrate on following areas:

- **Distortion in small gaps.**
- **Weld tips (terminations).**
- **Intersecting welds.**
- **Reduction in x-sections.**
- **Skewed bridges.**
- **Wrapped around welds.**

Typical details to inspect for localized fatigue cracking:

1. Lateral connection plates with intersecting welds, weld tips, & gaps or backing bars and tack welds.
2. Transverse connection plates. (Need to be positively connected to both flanges.)
3. Longitudinal stiffener butt welds, fillet welds, and cope holes.
4. Floorbeam to girder connection. (Coped beam flanges or blocked beam flanges.)
5. Rolled beam diaphragm connection. (Also, with coped flanges.)
6. Coverplate end welds and butt welds.
7. Termination of longitudinal coverplate welds. (Not end welded.)
8. Web plate penetration including box pier caps.
9. Web and flange splices. (Particularly field welded - quality may be suspect. Built-up welds)
10. Web cope holes
11. Stringer to floorbeam connections (out-of-plane bending)
 - Stringer framing into Girder webs - Category E or E'
 - Stringer framing into Girder flange - Category E or E'
12. Lateral connection to girders and floorbeams.
13. Backing bar splices. (Backing bars should be continuous. Ideally should be removed, but not practical.)
14. Repaired holes with partial or complete plug welds.
15. Tack welds. Near ends of plates. Near end of backing bars. (AWS requires that tack welds be properly removed or incorporated into permanent weld. Identify as potential locations for fatigue cracks.)
16. Gouges and arc strikes.
17. Intermittent fillet welds. (Category E for web to flange or CP to flange.)
18. Pin & hanger assemblies.
19. Insert plates in haunched girders.
20. Riveted members (girders & trusses) with tack welds or subject to prying action.
21. Corrosion induced defects.
22. Construction & traffic damaged areas.
23. Field welding of curved girder cross frame members (Category E equivalent) (Check quality of field welds, terminations of welds, undercutting or notch effects)
24. Field welding of attachments to tension areas of webs or flanges after the bridge was built.