Bridge Management Office
AASHTOWare BrM
Quick Guide

Version 3 – December 2024

EDITION & REVISIONS PAGE

The purpose of this document, the BrM Quick Guide (BQG) is to provide guidance and direction with regards to the use of AASHTOWare Bridge Management (BrM) for the inspection, rating, and management of bridges by the South Carolina Department of Transportation (SCDOT). Any modifications to this document require approval of the SCDOT Bridge Management Office (BMO). This document will be reviewed and updated as needed by the Assistant State Bridge Maintenance Engineer (ASBME) or designated representative. However, SCDOT reserves the right to make interim updates to the procedures to address lessons learned, evolving approaches, updates to federal, state, and local laws, regulations, and policies.

Release Date	Version	Sections Revised
September 2023	0	Initial Release (Draft)
January 2024	1	Updated Chapter 12 and Appendix B
July 2024	2	Second Initial Release with Appendices C-F
December 2024	3	Updated and Released for BIGD TN04 and TN05

HELP DESK

If you require help or assistance with BrM or the BIGD, please use the Help Desk that we have set up. In addition to the help desk, several tutorials are available on SCDOT's ProjectWise, link here.

If you receive a BrM error (red screen or red text), please take a screen shot and include the error in your message to us. This will expedite a response. You can take a screen shot by pressing Press Ctrl + PrtScn keys on your keyboard.

- Option 1 (**Preferred**), you can complete the Help Desk Form. Please bookmark this webpage to save for future use.
- Option 2, you can email the Help Desk.

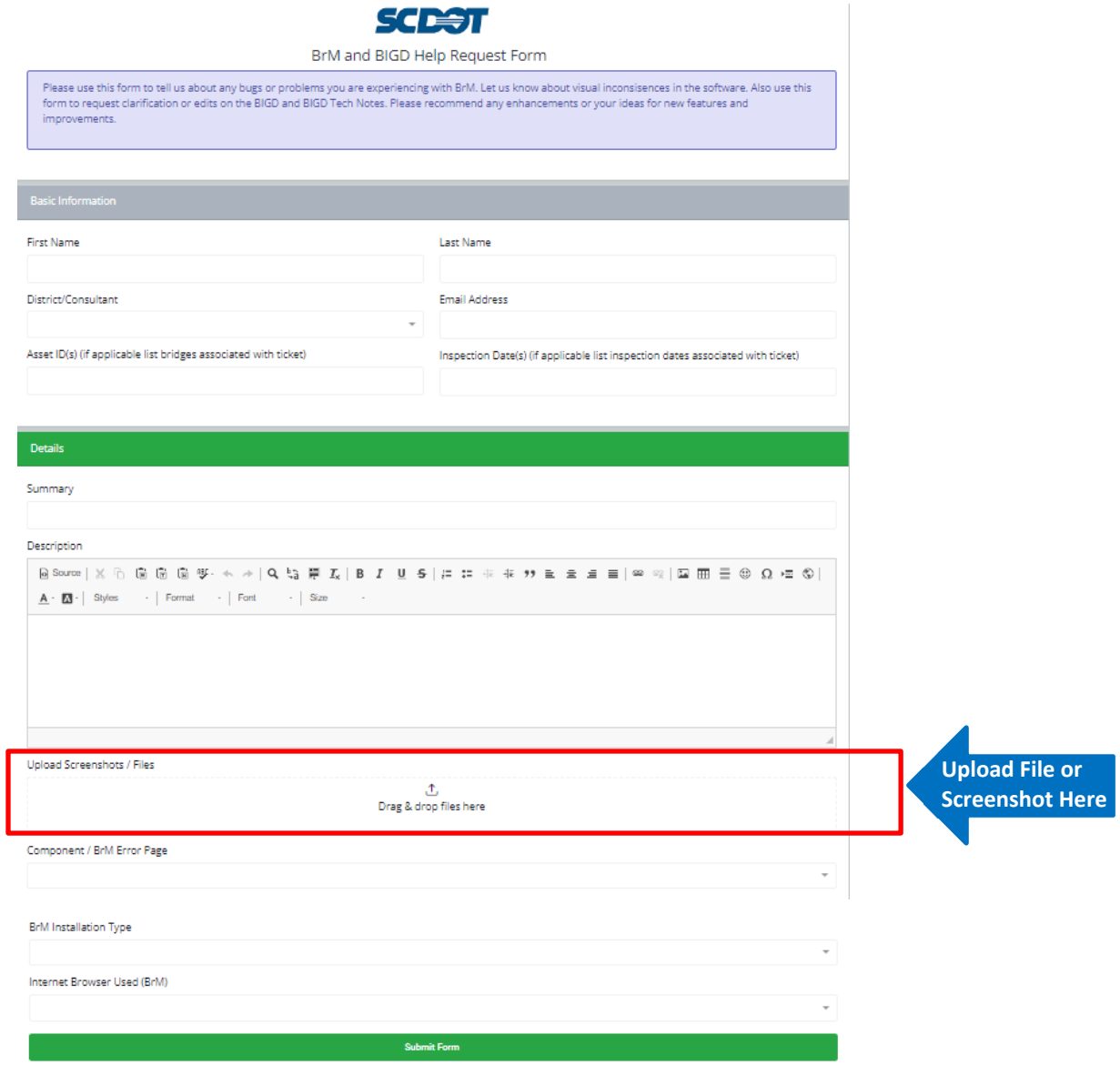


Figure 0.1. Screen capture of BrM and BIGD Help Request Form

ADDING USER TO BRM – BRM USER REQUEST FORM (BURF)

If you need to be provided BrM Access, complete the BrM User Request Form (BURF). This will get the process started for you to have an account in BrM.

Link to BURF: Link to BURF

Please read these instructions:

1. Users should only be in one group labeled "(All Staff)" and this shall be the firm they are employed by.
2. Staff working for a subconsultant shall be in their firm's "Inspectors" and/or "Load Raters" Group as well as the "Inspectors" and/or "Load Raters" Group of their Prime Consultant.
3. Staff involved in QC/QA reviews shall be in the QC or QA groups for the firm they are working for.
4. District and District DBIS Groups are for SCDOT Staff Only.

If you are unsure about the User ID, try accessing the BrM website via the link in Section 1 and report the User ID that is automatically generated as input per your Microsoft account.

***** WARNING *****

You will be required to input your User ID and Email. BrM is enabled with Microsoft Single Sign On (SSO). The User ID for all users should be the user's Microsoft account. Anyone with a Microsoft account won't need a password, it'll automatically log you in through the credentials you've used to log into your computer. Most users have User ID and Email the same, but some will be different, for example, an email may be bridge.inspector@scdot.org but the Microsoft account is binspector@scdot.org. User ID and Email and not editable! Please ensure this is correct the first time or the user will need to be deleted and added back in.

INSPECTION STATUS AND COPYING PREVIOUS INSPECTIONS

When a new inspection event is created in BrM (either from an assignment or as an unscheduled inspection), BrM will make a copy of all inspection level data (bridge condition, elements, notes, etc.) and use this copy of this inspection level data moving forward to make the new inspection event. If data is updated in penultimate inspection after the new inspection is created, it will not be transferred to the new inspection. In the future, the new inspection (as the most recent inspection) would be used for any subsequent inspection events started for the bridge.

Please see the tips below to help maintain data integrity when managing multiple inspection types at once.

1. Pay attention to the inspection status for the inspection events on the bridge. Inspection status appears at the bottom of the Inspection > Inventory, Condition, Appraisal Page. The status will change based on which inspection event is selected in the upper right of the same page.

Figure 0.2. Inspection Event Selector with Inspection Date, Inspection Key and Inspection Type Shown

Figure 0.3. Inspection Status Selector with Inspection Status Shown

Inspection Statuses in BrM

- New/Open for Edit – Editable to any user with access to the bridge. The inspection has not yet been submitted.
- Locked – Inspection data is locked, inspection review completed.
- In Review – Locked – Inspection is in review and is with the QC Reviewer, QA Reviewer, Posting Review, etc. It may be first review cycle or in backchecking.
- In Review – Unlocked – Inspection has been returned to the Bridge Inspection Team Leader and/or Report Author for revisions following review.

2. Consider combining inspection types with similar due dates. If possible, combine inspections together into a single event to minimize the risk of data loss.

3. For non-reportable FHWA inspection types, users should wait to start inspections until they are ready to finish the inspections. A non-reportable FHWA inspection such as Inspection Procedure, Load Rating, Hydraulic Analysis and Unscheduled Inspections should be started and submitted as soon as possible. This process will expediate needed documentation and keep the bridge's inspection status from pending as "New/Open for Edit". **Users should not keep bridge's inspection status from pending as "New/Open for Edit" with no data to update.**

4. Coordinate with the user identified as the Bridge Inspection Team Leader and/or Report Author for bridge that has an inspection status as "New/Open for Edit" before starting a new inspection event. **The user who starts a new inspection event and risks data not being carried over is responsible for any data loss and any subsequent data correction.**

5. Users are reminded that data does not have to be updated in BrM for 3 months after the linked event. While users are encouraged to update data as quickly as possible, potential data risk is a bigger concern that all users should attempt to mitigate. Data does not have to be updated on the same day or immediately.

6. District Bridge Inspection Supervisors and Project Managers can always delete inspection events which contain inaccurate data and restart inspection events to copy correct data forward.

7. If you need help moving data from inspection event to inspection event, please submit a Help Desk ticket. **It is helpful to include the Asset ID Number and the Inspection Keys for the inspection events discussed in a Help Desk ticket.**

A common sequence of events following a bridge inspection is outlined below. Users are encouraged to use this as an example of how best of maintain data accuracy. See next page for recommended and not recommended actions.

- Routine Bridge Inspection, defect discovered which requires Critical Finding Posting and Load Rating.
- District installs Critical Finding Posting Signs 2 days after Critical Finding Notification
- Consultant performs Load Rating 45 days after Routine Bridge Inspection
- District installs Posting Signs 25 days after Posting Form Signed
- Special Bridge Inspection to monitor defect needed 3 months after Routine Bridge Inspection

Table 0.1: Recommended Actions for Multiple Inspection Events at Same Time		
Event	**Recommended Practice**	**Not Recommended**
Routine Bridge Inspection, defect discovered which requires Critical Finding Posting and Load Rating	Routine Inspection Event started from Inspection Assignment. Critical Finding Reported using Routine Inspection Event. Load Rating request submitted on Submit Page. Special Inspection added at 3M interval.	• Do not create an Unscheduled Inspection to request the Load Rating. • Do not create an Unscheduled Inspection to report the Critical Finding. • Do not start an Unscheduled Load Rating.
District installs Critical Finding Posting Signs 2 days after Critical Finding Notification	If the Routine Inspection is still open, the District should provide photos of installed signs to the BITL to add to the report's multimedia files. Report text and traffic status should be updated by the BITL. The District should address the Critical Finding with the same Routine Inspection linked.	• Do not create an Unscheduled Inspection to include photos of the Posting Signs and change the traffic status. The Routine Inspection is still open. • Do not wait to address the Critical Finding.
Consultant performs Load Rating 45 days after Routine Bridge Inspection	The Consultant will see the load rating assigned to the load rating assignment but there is no need to start the load rating event in BrM until data is ready. The load rating engineer should check that the Routine Inspection Event is locked before starting the load rating event.	• Do not start the load rating as soon as it is assigned. Since load ratings are non-reportable inspection types, inspections should be started and completed in short order.
District installs Posting Signs 25 days after Posting Form Signed	The District needs to make sure that the Routine Inspection Event and the Load Rating Inspection Event are both locked before starting an Unscheduled Inspection to add photo of the posting signs, change traffic status, and add inspection notes. The District shall coordinate as needed to get events locked before starting the Unscheduled Inspection.	• Do not create an Unscheduled Inspection to include photos of the Posting Signs and change the traffic status if any of the previous inspection events are open.
Special Bridge Inspection to monitor defect needed 3 months after Routine Bridge Inspection	The inspection still needs to take place in the required month of the interval but the inspection event in BrM should not be started until all the previous inspection events are locked. The BITL shall coordinate as needed to get events locked before starting the inspection.	• Do not create a Special Inspection if the previous BrM events are not locked.

TABLE OF CONTENTS

ACRONYMS, DEFINITIONS, & RELEVANT DOCUMENTS

The following abbreviations and definitions are used within this document:

AASHTO - American Association of State Highway and Transportation Officials

BFP - Bridge File Policy

BIGD - SCDOT *Bridge Inspection Guidance Document*

BMO - SCDOT Bridge Management Office

BQG - AASHTOWare BrM Quick Guide (this document)

Bridge File - Refers to the SCDOT ProjectWise storage system holding all files.

CSB - Critical Security Bridges

ED - Engineering Directive

FHWA - Federal Highway Administration

LRGD - SCDOT *Load Rating Guidance Document*

NBIS - National Bridge Inspection Standards

QA - Quality Assurance

QC - Quality Control

SCDOT - South Carolina Department of Transportation

SNBI - Specifications for the National Bridge Inventory

1 Overview

1 OVERVIEW

BrM updates the DOT's database live meaning that changes made on inspection screens are made in the database in real time when a user presses "Save" on the Page they are working on. This is particularly important when requesting inspections on the Submit Page and completing the Request Group Box. Note that SCDOT data is not completed until QC/QA is finished, if performed for that inspection event type. Data from December inspections must be finalized prior to the March NBI data submittal to FHWA.

SCDOT BrM Access Link:

https://govprodeast.mayvue.com/SCDOT/

***** WARNING *****

BrM's application pool serves SCDOT's Production Site is set to recycle at 2 AM EST daily. All users are logged off and the application resets at this time each day.

2 User Profile

2 USER PROFILE

Your user profile contains information about you as is critical to perform bridge management activities.

2.1 My Account Information

Enter your information after you log-in to BrM for the first time. Information may be incorrect from original entry by others. Important account information is discussed below.

User ID – If your name was provided as a BrM user, you should be automatically signed into the application. If you have issues signing in, you can submit a Help Desk ticket. BrM uses Microsoft Single Sign-On functionality. If you're having log in problems, your Microsoft account may be different than the User ID listed.

Agency – SCDOT Staff should have their Agency set to SCDOT. Consultants should have their company name. Other users should have their organization listed such as "FHWA" or "City of Columbia".

Email – Email is required. BrM will send automated email to users. Please make sure an accurate and viewed email address is provided.

2.2 Landing Page

Set the page that appears when you first open BrM.

2.3 My License Information

Ignore for now, not used by SCDOT.

2.4 Qualifications, Years of Experience and Certifications

A user's qualifications are automatically determined based on the years of experience and certifications. Users will be unable to perform certain duties without qualifications.

2.4.1 Years of Experience

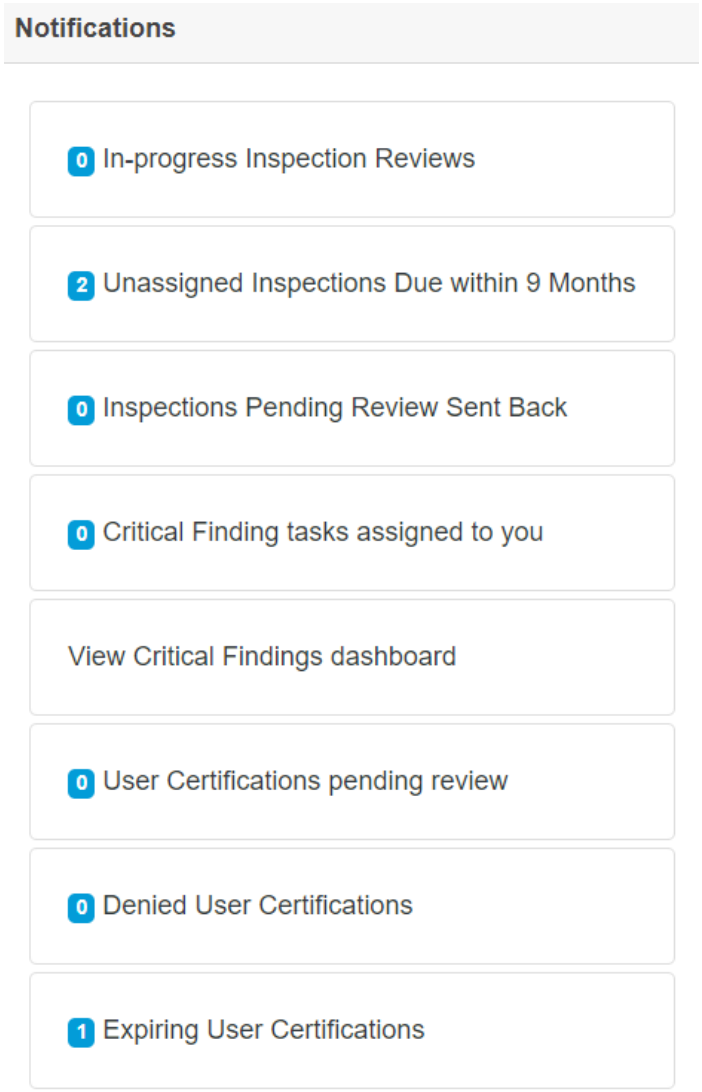
Add all types of experience that you may have. Certain years of experience is required for certain certifications. If you're still performing that duty, use the "Ongoing" checkbox. If you're no longer active, provide an end month and year. "Ended" Experience cannot be revised. Submit a Help Desk is you need to revise this. If a type of experience should be added, submit a Help Desk ticket. **Users are unable to edit experience once entered, please use care in correctly inputting years of experience and verify before hitting submit.**

2.4.2 Certification

Under the Category "SCDOT" all available certifications are listed. Depending on the certification you select, a file may or may not be required to be uploaded to BrM from your computer. **Files that are uploaded to BrM cannot contain a period (".") in the file name before the file suffix; make sure you name your files accordingly.**

3 My Dashboard

3 MY DASHBOARD



"My Dashboard" provides users with a quick snapshot of personal notifications for activities needing their attention. Some notifications won't appear to all users based on permission level.

In-Progress Inspection Reviews – If you have intitated a QC or a QA Review and you need to return to the review page, click here. This count the number of inspection events where inspection review is in progress and currently logged in user is currently assigned reviewer.

Unassigned Inspections Due within 9 Months – Only viewable to BMO users. Counts the number of inspections meeting conditions to be displayed in 'Unassigned Inspections Due in Next 9 Months' table of 'Manage Inspection Assignments' page.

Inspections Pending Review Sent Back – If you're a team leader or load rater and you're expecting review comments, this is where to look. This counts inspection events where review is in progress and currently logged in user is selected as user the report has been sent back to.

Critical Finding Tasks Assigned to you – Displays the number of tasks from the Critical Finding Page if the task assignee is currently logged in user and the task's 'Complete Date' is empty. Does not display Critical Finding review pending tasks or tasks for reviewed Critical Findings.

View Critical Finding Dashboard – Only viewable to DOT users. No count displayed. This is a quick link to the Critical Finding Dashboard.

User Certifications Pending Review – Only viewable to BMO users. Counts the number of Certifications for the whole agency where the status of the Certifications is pending.

Denied User Certifcaitions – Counts the number Certifications for currently logged in user where the status is 'Denied'.

Expiring User Certifcaitions – Counts the number Certifications for currently logged in user where Certification has the latest 'Completed Date' for any 'approved' Certifications for that user of that Certification Name, Certification 'Notify of Expiration' is not empty for that Certification Name AND number of days for current date - 'Expiration Date' is less than or equal to 'Notify of Expiration' number of days AND 'Expiration Date' is not past date.

4 Bridges

4 BRIDGES

The "Bridges" Tab provides bridge information at a user's fingertips. **Note: Access is restricted by the district or by consultant district assignment according to access filters (see Section 4.1). If you require access to a bridge outside of your access filter, please contact the Help Desk.**

Use the "?" function ( ) in the upper lefthand corner for specific topic assistance.

4.1 Filters

Filters control access to bridges. By using a filter, bridges will not display in the Bridge List or be available for search on a BrM Page based on specified criteria. Filters are created and managed by BrM Admins. If users want no filter applied, select "[No Bridge Filter]" as your filter. Submit a Help Desk Ticket to suggest new filters. Table 4.1 includes a list of available filters. There is also a filter for bridges in each district and a list of active bridges in each district.

Table 4.1: BrM Filters

Filter Name	Filter Notes
BMO List: Border Bridges	List of Border Bridges owned by SC or owned by other states where a border agreement is in place with SC.
BMO List: Bridges w/ NSTMs	List of bridges with NSTM Inspections.
BMO List: Complex FHWA Type	List of bridges that meet the FHWA criteria for a bridge with complex features.
BMO List: Complex LSC	List of bridges that meet the SCDOT criteria for a Long Span Concrete (LSC) bridge.
BMO List: Complex LSS	List of bridges that meet the SCDOT criteria for a Long Span Steel (LSS) bridge.
BMO List: Complex MSA	List of bridges that meet the SCDOT criteria for a Multi-Span Approach Span (MSA) bridge.
BMO List: Complex MSM	List of bridges that meet the SCDOT criteria for a Multi-Span Main Span (MSM) bridge.
BMO List: Island Mobility Bridges	List of bridges that meet the SCDOT criteria for an Island Mobility Bridge.
BMO List: Scour Critical	List of bridges that meet the FHWA criteria for a scour critical bridge.
BMO List: UW Insp Required	List of bridges with UW Inspections.
Movable Bridges (TSC Access Filter)	Not viewable to all users. Provides Access to District 5 movable bridges to the District 6 consultant.
Pending Reviews Summary	List of bridges with inspection events under review and a summary of review status.
SCDOT Timber Report	List of bridges with timber pile elements.

4.2 Layouts

The layout determines the information viewable on the columns of the Bridge List. All users are allowed to create their own layout. **Note: User created layouts must have the "Shared" checkmark unselected, so they are only viewable to that user.** Submit a Help Desk Ticket to suggest new layouts for department wide use. A list of layouts is included in Table 4.2 Note that each of the BMO List Filters (see Section 4.1) has a custom layout to display applicable data.

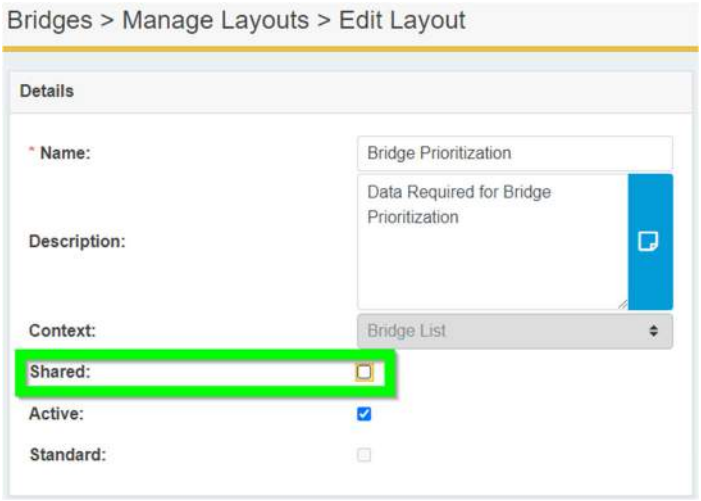


Figure 4.2 User Created Layout Must by "Unshared" on the Edit Layout Page

Table 4.2: BrM Layouts

Layout Name	Layout Notes
[SCDOT Default]	Standard Layout
SCDOT District / Consultant Assignment	Bridge by Assignment (District of Consultant)
SCDOT Lat Long	Standard Layout with Latitude and Longitude (use for Map Export)
SCDOT Old Clearance Page Data	Used for Conversion to New Clearance Page (see Appendix C)
SCDOT Posting Sign Values	Bridges and Current Posting Sign Values
SCDOT Skinny Leg	Summary of Bridges with Skinny Leg Channels

5 Inspection Types in BrM

5 INSPECTION TYPES IN BRM

While most bridges receive scheduled inspections, occasionally there is a need to perform an unscheduled inspection event. In this instance, a new inspection event may be initiated from "Start Unscheduled Inspection" Page under the "Bridges" Tab.

***** WARNING *****

BrM updates data live in the DOT's database and allows multiple inspection events at the same time on bridges.

For a scheduled inspection (generated from "My Assignments"), a user shall add other inspection types performed to an inspection type that has already been assigned. An example of this would be a Routine and Non-Redundant Steel Tension Member (NSTM) Inspection occurring at the same time. The adding of inspection types occurs at the "Create Inspection" Screen after a user presses the "Play" Button (X) on their assignment table.

For an unscheduled inspection (generated from "New Inspection" under the Bridges Tab), a user shall add all inspection types being performed before pressing "Create".

Table 5.1: Available New Inspections (Unscheduled)

Inspection Type	FHWA Roll Up Inspection	Required User Qualifications	Notes
Damage	N/A	Bridge Inspection Team Leader	
Data Update (BMO Only)	N/A	Bridge Management Office Only	
Hydraulic Analysis (Unscheduled)	N/A	Hydraulic Design Support Office	
Initial	Routine	Bridge Inspection Team Leader	
Initial (Complex)	Routine	Complex Bridge Inspection TL	
Load Rating (Unscheduled)	N/A	Bridge Design Engineer	
Safety	N/A	Bridge Inspection Team Leader	
Scour	N/A	Bridge Inspection Team Leader	
Unscheduled	N/A	Bridge Inspection Team Leader	

When starting an inspection, a user must enter the inspection date, name of the inspector and name of the report author. SCDOT is currently not completing the field for "Engineer of

Record". Editing the parking location and parking notes with an advised inspection staging location is optional and not required.

Table 5.2: Available Scheduled Inspections (Assignable)			
Inspection Type	**FHWA Roll Up Inspection**	**Required User Qualifications**	**Notes**
Complex Routine/ Movable	Routine	Bridge Inspection Team Leader/See BSIP	
Hydraulic Analysis	N/A	Hydraulic Design Support Office	
In-Depth	In-Depth	Bridge Inspection Team Leader/See BSIP	Other In-Depth not listed below.
In-Depth Fatigue Inspection	In-Depth	Bridge Inspection Team Leader/See BSIP	
In-Depth Timber Inspection	In-Depth	Bridge Inspection Team Leader	
In-Depth Timber Underwater Inspection	In-Depth	UW BITL and Dive Team	
Inspection Procedure	N/A	Bridge Inspection Team Leader	
Load Rating	N/A	Bridge Design Engineer	
Nonredundant Steel Tension Member	NSTM	NSTM BITL	
One-Time Inspection	N/A	Bridge Inspection Team Leader/See BSIP	
Routine	Routine	Bridge Inspection Team Leader	
Service	Service	Bridge Inspection Team Leader	
Special	Special	Bridge Inspection Team Leader	
Underwater (Unscheduled)	Underwater	UW BITL and Dive Team	Includes requested Initial UW Inspections
Underwater	Underwater	UW BITL and Dive Team	

WARNING ***

Only inspections in Table 5.2 can be scheduled and assigned. If a user attempts to schedule a future inspection that is listed in Table 5.1, it will not be assigned and may lead to a missed inspection.

6 Inspection Prep

6 INSPECTION PREP

6.1 My Assignments

The BMO or designee manages the inspection assignments given to user groups. One group is created for each district and one group is created for each inspection prime consultant. Other groups are given assignments as well such as consultant load raters, other DOT staff, etc.

User groups set up for assignments can have multiple points of contact. The groups' point of contact has additional responsibility as outlined in this section. Additional reporting will be developed to alert points of contact regarding changes in their inspection assignments but until reports are developed, **points of contact shall review inspection assignments regularly**.

Incomplete group assignments are displayed by default, users can show complete group assignments by clicking the checkbox. Group assignments are exportable to Excel and searchable by assignment name. Click the View button (👁) to review a specific assignment.

YYYY-MM D# - DISTRICT # *or* CONSULTANT

Figure 6.1.1 Standard Inspection Group Assignment Naming Convention

Inspection assignment progress is tracked with both a progress bar and a color-coded map according to the colors below.

Figure 6.2.2 Standard Color Codes for Group Assignment

The quantity of equipment and inspection procedures applicable to that bridge AND that inspection type are displayed. Click the View button (👁) to review.

6.1.1 Assignment Actions for an Inspection

The available actions for each inspection are to start or reassign (📅 📅). Bridge inspectors may start an inspection if they are qualified to do so. Users not qualified to perform that inspection type will be unable to start an inspection. Points of contact may request their inspection assignment be reassigned to another group. A comment in the popup **SHALL** be provided for the request for BMO review.

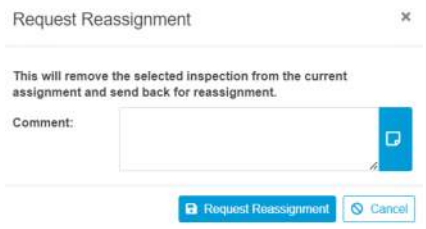


Figure 6.1.1 Request Reassignemnt Popup

6.1.2 Out-of-Interval Inspections and Reassignment Requests

Per Section 4.12.2 of the BIGD, inspectors may need to move inspections out of the month they are due and into another month a. Inspectors must request a reassignment for these inspections, even if the out-of-interval inspection is within SCDOT's acceptable tolerance. When the request for reassignment is made, the inspectors shall note what assignment the inspection needs to be moved to and note whether it is within the acceptable tolerance or beyond the acceptable tolerance. Inspectors performed beyond the acceptable tolerance require the use of the Out-of-Interval Form.

6.1.3 Starting Multiple Inspections

Users may need to start multiple inspections during the same inspection event. Users need to review their assignments and see if other inspections are due on the same bridge during that month. To perform multiple inspections at the same time, start one inspection and click the checkbox for another inspection type on the Bridges > New Inspection Page. The text "*assigned to your inspection group and due 08/31/2024*" appears on the Bridges > New Inspection Page.

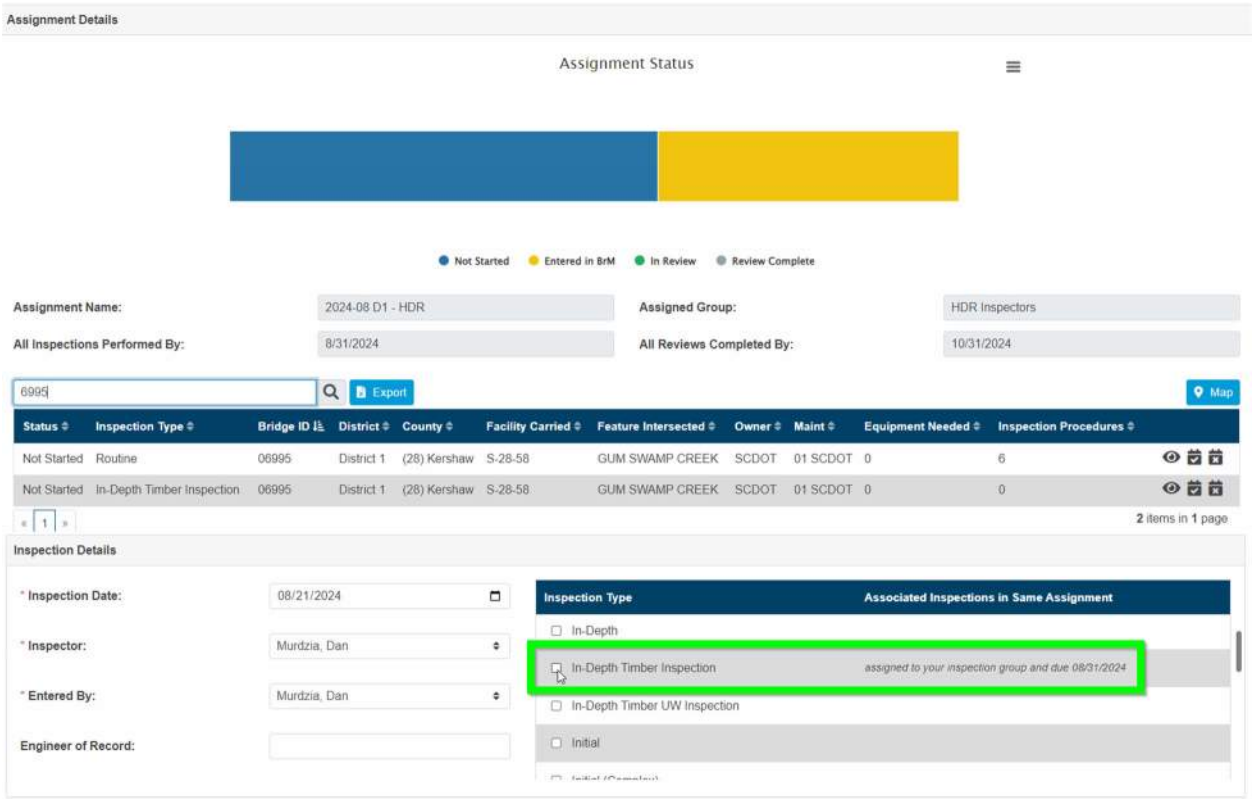


Figure 6.1.3 Starting Multiple Inspections

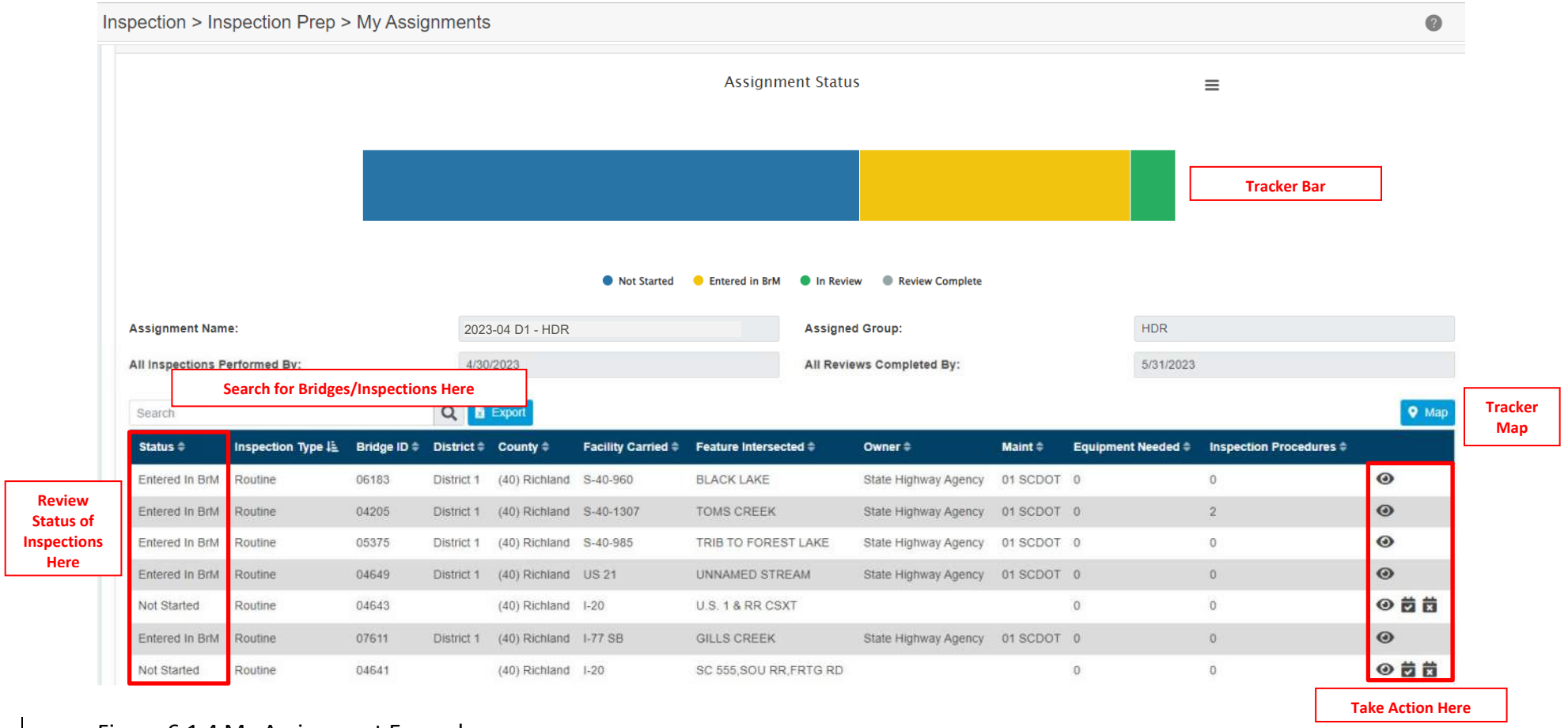


Figure 6.1.4 My Assignment Example

When starting an inspection, a user must enter the inspection date, name of the inspector and name of the report author. SCDOT is currently not completing the field for “Engineer of Record”.

***** WARNING *****

BrM updates data live in the DOT's database and allows multiple inspection events at the same time on bridges.

For a scheduled inspection (generated from "My Assignments"), a user shall add other inspection types performed to an inspection type that has already been assigned. An example of this would be a Routine and Non-Redundant Steel Tension Member (NSTM) Inspection occurring at the same time. The adding of inspection types occurs at the "Create Inspection" Screen after a user presses the "Play" Button (X) on their assignment table.

For an unscheduled inspection (generated from "New Inspection" under the Bridges Tab), a user shall add all inspection types being performed before pressing "Create".

6.2 Logistics

Editing the parking location and parking notes with an advised inspection staging location is optional and not required.

6.2.1 Procedures

Applicable inspection procedures to the bridge and to the inspection type are displayed on the Logistics Page and can be viewed prior to and during an inspection. Users cannot edit inspection procedures on the Logistics Page. To complete an inspection and "Submit for Review" (see Section 8), one of the two following conditions MUST be met:

1. All inspection procedures were completed by the inspection team and the BITL has marked all procedures as complete.
2. At least one inspection procedure was not completed and the BITL has added a reason why the procedure was not completed to Procedure Notes.

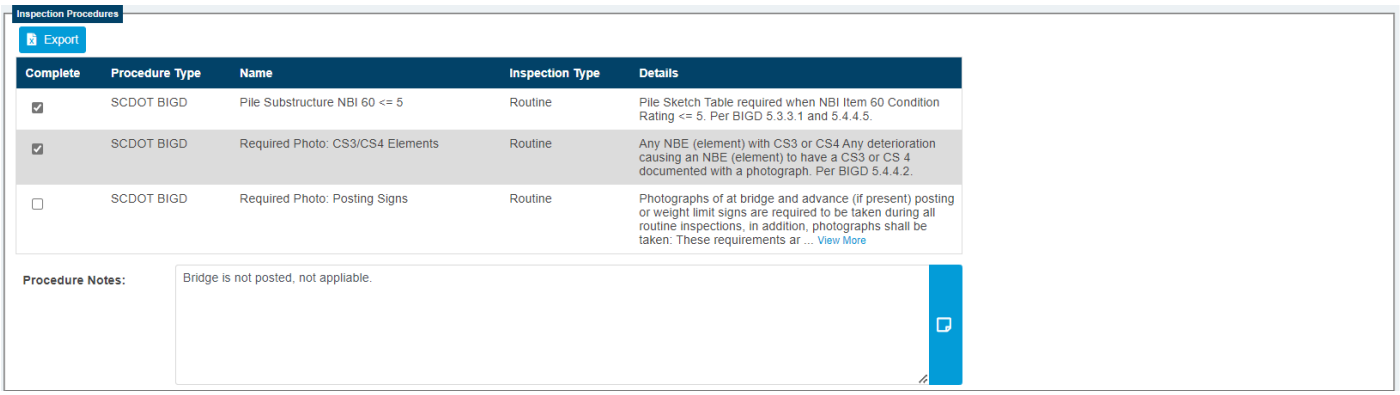


Figure 6.2.1 Inspection Procedure Group Box

If at least one procedure checkbox is unchecked and Procedure Notes is blank, the inspector will receive an error when attempting to submit.

For DOT inspectors, if a procedure needs to be added, revised, or removed, an Inspection Procedure inspection shall be requested on the Submit page. See Section 8.

For consultant inspectors, if a procedure needs to be added, revised, or removed, the process outlined in Section 6.3 shall be followed.

6.2.2 Equipment

Equipment used during the inspection shall be selected for any equipment listed. To revise equipment, click “Manage Equipment”. SCDOT is not currently using the “Hours” and “Costs” columns on the equipment table. Available equipment is listed in Appendix A. Users should suggest other equipment options via the Help Desk.

All available equipment is listed to select for the inspection. Press and hold “Ctrl” to select more than one piece of equipment at once. There is also a search function. The alphanumeric code associated with equipment is the code provided by FHWA in the Specifications for the National Bridge Inventory (SNBI). Use the left and right arrows to move equipment from available to selected. Equipment under the selected heading is the equipment used during the inspection.

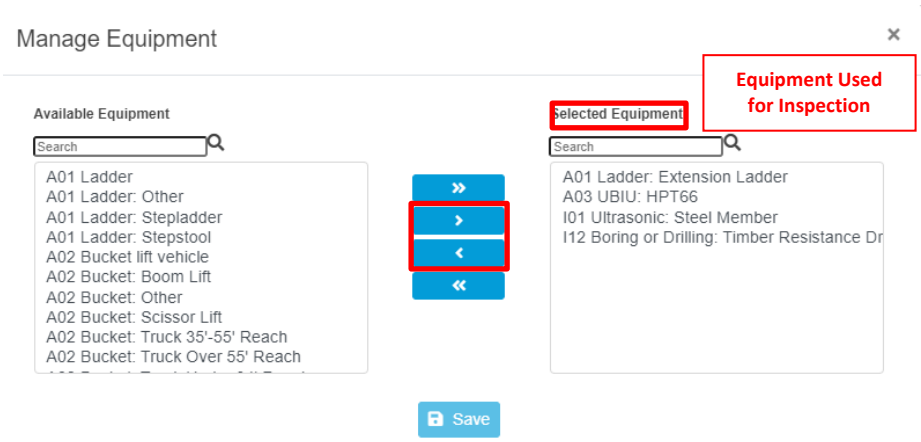


Figure 6.2.2 Inspection Equipment Popup

6.3 Procedures

During the BrM Implementation Process, standard inspection procedures for routine inspections, UW inspections, NSTM inspections and inspections of complex bridges were automatically ported into BrM. However, many bridges have specific procedures that need to be captured in BrM per FHWA.

Table 6.3 includes a list of inspection types, if a Bridge-Specific Inspection Procedure is required and if BrM has inspection procedures already applied to that inspection type or not. **Note: Underwater (Unscheduled) inspections do not require inspection procedures.**

Inspectors are responsible for updating all inspection procedures in BrM. They are encouraged to update procedures before an inspection is started.

**** TIP: Project Managers and DBIS shall be aware of the bridges on their future assignments and seeing the inspection types and procedures applied to the inspection (both viewable on the inspection assignment screen). Users should prepare inspection procedures months in advance and not wait until the inspection is already started. BrM tracks inspections that require BSIPs and will report any inspections that are missing procedures. ****

Table 6.3: Inspection Procedures in BrM by Inspection Type

Inspection Type	Procedure Notes
Complex Routine/ Movable	BrM has BSIPs already assigned to bridges where applicable. BITLs shall review and request updates as needed.
In-Depth	In-Depth Inspections require BSIPs but due to the nature of inspections, BrM does not have any BSIPs pre-assigned. BITLs shall request FWHA-required BSIPs.
In-Depth Fatigue	In-Depth Fatigue Inspections require BSIPs but due to the nature of inspections, BrM does not have any BSIPs pre-assigned. BITLs shall request FWHA-required BSIPs.
In-Depth Timber / In-Depth Timber UW	BrM has BSIPs already assigned to bridges where applicable. BITLs shall review and request updates as needed.
NSTM	BrM has BSIPs already assigned to bridges where applicable. BITLs shall review and request updates as needed.
Routine	BrM has BSIPs already assigned all bridges. BITLs shall request additionally BSIPs as needed.
Scour	Scour Inspections may require BSIPs. BITLs shall request BISPs as needed.
Special	Special Inspections require BSIPs but due to the nature of inspections, BrM does not have any BSIPs pre-assigned. BITLs shall request FWHA-required BSIPs.
Underwater	BrM has BSIPs already assigned to bridges where applicable. BITLs shall review and request updates as needed.

7 Inspection

7 INSPECTION

At the start of BrM implementation, SCDOT is introducing new State Bridge Inventory (SBI) data fields beyond the fields collected in BIO and included in the *Recording and Coding Guide*.

**** TIP: See Appendix H for requirements to code select data using the SNBI Collector. ****

Table 7: Summary of Data Fields in BrM	
Data Values	**Notes**
NBI Items (001 to 116)	Structure Inventory and Appraisal Values
SBI Items (400 Series Numbers)	Fields in RIMS (may be RIMS or BrM controlled)
SBI Items (500 Series Numbers)	BMO Only Fields (not included in RIMS)
SBI Items (600 Series Numbers)	Fields related to New SNBI Fields
SBI Items (800 Series Numbers)	BMO Load Rating Fields (not included in RIMS)

7.1 Inventory, Condition, Appraisal

For assistant with coding new SNBI fields, see the SNBI on FWHA's website. Use the "?" function ( ) in the upper lefthand corner for specific topic assistance.

7.1.1 Element Conditions

BrM performs element-based inspections and element notes replace BIO textual fields. At the start of BrM implementation, BIO textual fields have been ported into applicable elements, but text may be ported to several elements such as bent cap and piles. Inspectors shall review and revise as needed. Inspection notes shall follow this standard format for noting defects.

Brief Description of Element (Sizes Optional).

Location > Defect. (Condition State, Quantity, Photo (if applicable).

7.5" Thick Reinforced Concrete Cast-In-Place Deck.

Span 1 and 3, (2) longitudinal hairline cracks up to 15'L with efflorescence. (CS2, Q60, Photo 4)

Figure 7.1.1 Inspection note format and example.

**** REMEMBER: Inspection notes shall be placed under the applicable element and not under the applicable defect. If notes exist in the defect text box, move to the element text box or delete. ****

The checkmark at the left side of the Element Condition table indicates what elements are inspected during the subject inspection and which ones are not. The checkmarks shall be used for all inspections.

**** TIP: When needing to lower the total quantity, the auto calculated CS1 total will not update on its own. Click and enter a value in another condition state total, when you press enter, the CS1 total will correct. ****

7.1.2 Use of Structure Units

SCDOT's preference to use only one structure unit on bridge unless you run out of characters. If you run out of characters, then can separate all the approach spans into one structure unit and have a main span structure unit. The next step would be separating by span configuration (i.e. - North Approach Span, South Approach Span, Main Cable Span, etc.). If all of these options are exhausted, contact the Bridge Management Office. Since Structure Units are mostly always only needed on bridges with complex features, the Structure Unit Configuration is located on the Inspection > Complex, UW, NSTM Page.

7.1.3 Condition and Appraisal

For bridges over waterways, NBI Item 061, SBI Item 601 and SBI Item 631 shall be coded by bridge inspectors. NBI Item 071 and NBI Item 113 shall be coded by the Hydraulic Design Support Office (HDSO). See Section 8 on how to submit a request for HDSO to review these items.

7.1.4 Bridge Data

Note that latitude and longitude are fields editable by bridge inspectors. Requests no longer need to be submitted to Road Data Services (RDS).

7.1.5 Non-Element Inspection Notes

These text boxes should NOT be used to provide data that is placed in other data fields or element notes. For example, inspection date, weather and inspector name shall NOT be placed in the Miscellaneous Notes section. SBI 623 (Summary of Previously Performed Maintenance Work) shall be completed as text only per the commentary in the SNBI.

**** REMEMBER: If cells are not applicable, DO NOT place "N/A" in the cell. Leave the textbox blank. ****

7.1.6 Streambed Data

A checkbox is included if the water depth is 4' or more and the BITL does not intend to request an UW. A reason should be included in the Miscellaneous Notes section of the report.

Information in the Scour Condition, POA and Vulnerability is edited by the HDSO expect the inspector should note if they are following any of the inspection actions included in the POA and complete field SBI 442A.

7.1.7 Posting Sign Values

The values on the posting signs shall appear in the fields for SBI 443 to 448 for the legal and EV signs. If the bridge is not posted, the fields should appear blank. If the bridge has a 40T combination mobility posting, use the dropdown for SBI 889.

**** REMEMBER: If the values on the signs are changing (increased posting, lower posting,etc.) the "Posting Sign Values" need to be updated by the inspector when the new sign are posted. Also, if a posting is being removed, the values in "Posting Sign Values" need to be blank and the 40T value needs to appear as "0 – No, Not Posted". ****

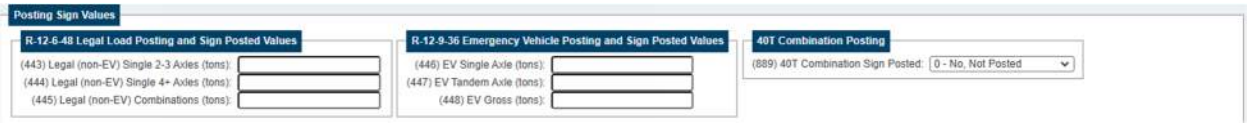


Figure 7.2.7 "Posting Sign Values" for a bridge not posted.

7.1.8 Curb Reveal

Complete the curb reveal measurements at all four corners of the bridge and record in this group box. **See TN05 for updated curb reveal measurements a barrier/railing/parapet is not considered a curb.**

7.1.9 Culvert Fill Measurements

Inspectors do not need to record fill measurements in all five boxes. If the culvert has uniform fill under the roadway, the "max fill" field can be the only field completed.

7.2 Complex, UW, NSTM

This page is only editable to consultant inspectors. DOT inspectors have read-only access to this page.

If an underwater inspection is being performed, the inspector shall complete the fields included on this page.

Inspection risk factors for the inspection (including a NSTM or UW inspection) should be included on this page. The risk factors were previously developed and included in Attachment A5.28 of the BIGD but risk factors should be migrated to BrM as inspections are completed.

Structure Unit configuration is also located on this page. See Section 7.1.2.

7.3 Admin and RDS Pages

The Admin page is editable to only BMO users and the RDS page is not editable to any user. These pages do appear read-only to all other inspection staff.

7.4 Damage Page

This page replaces Attachments A5.8, A5.9 and A5.10 of the BIGD. Condition information of the elements damaged should appear on the Inventory, Condition, Appraisal Page. Information related to the damage event should appear on this page. The inspection following the damage event should clear the data located on this page before submitting.

7.5 HDSO Page

The HDSO page is editable to only HDSO users.

8 Submit

8 SUBMIT

Once a user has completed their updates to bridge data and they are ready to complete the inspection event, they can use the "Submit" Page to finalize their work. **NOTE: The "Submit" Page only works on the web browser version of BrM, inspections cannot be finalized on the mobile application.** There are three sections of the "Submit" Page: Inspection Summary, Schedule, and Requests. To assist the BMO is providing effective response to requests and to schedule the next inspection events, some inspection recommendations require the use of the Requests Group Box. Failure in completing both Schedule and Request may result in a delayed response. To properly submit an inspection event, users should follow the steps outlined below:

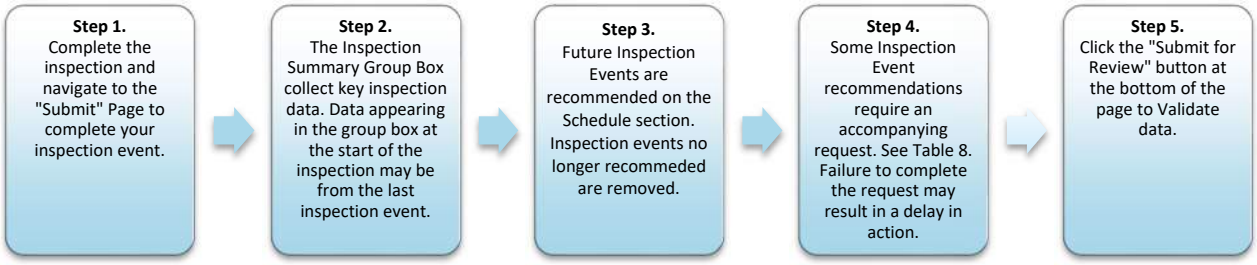


Figure 8: Steps to properly submit an inspection event in BrM.

Report Authors and other BITLs can submit a report where another BITL user is listed as the BITL. BrM will check the user qualifications of the listed BITL. If the BITL may not be changed and the BITL listed shall be the Team Leader who was performing as the Team Leader onsite. If other users need access to the bridge during the review process, users may change the listed Report Author as needed.

**** TIP: For non-reportable FHWA inspection types, users should wait to start inspections until they are ready to finish the inspections. A non-reportable FHWA inspection such as Inspection Procedure, Load Rating, Hydraulic Analysis and Unscheduled Inspections should be started and submitted as soon as possible. This process will expediate needed documentation and keep the bridge's inspection status from pending as "Open". ****

8.1 Inspection Summary

Key inspection data is collected in the Inspection Summary Group Box. Clarification items for this group box are outlined below:

- Weather and Temperature for multiple day inspection shall match the weather and temperature on the day used for the inspection date.
- Consultant Inspection with Repair Recommendations shall be completed for all inspections, as noted:
    - Not a Consultant Inspection
        - The inspection event was completed by a user not working for a consultant.
    - No Repair Recommendations
        - The inspection event was completed by a user working for a consultant.

        - No repair recommendations associated with the inspection event.
    - Submitted Repair Recommendations Form
        - The inspection event was completed by a user working for a consultant.
        - There were repair recommendations based on the Consultant's findings.
        - Attachment A5.6 has been sent to the District Bridge Inspection Supervisor (DBIS) for review and input into RIMS.
        - A5.6 has not been returned at the time the report is being submitted.
    - Completed and Uploaded Repair Recommendation Form
        - The inspection event was completed by a user working for a consultant.
        - There were repair recommendations based on the Consultant's findings.
        - Attachment A5.6 has been sent to the District Bridge Inspection Supervisor (DBIS) for review and input into RIMS.
        - The DBIS has returned the form (signed) along with the HMMS Entry Confirmation Report(s), if any.
        - The Consultant has uploaded A5.6 with the HMMS Entry Confirmation Report(s) attached to the "5 – Maintenance" Folder for the applicable bridge on SCDOT ProjectWise.

8.2 Schedule

The Schedule section is used to recommend future inspection events and remove future inspection events that are no longer needed.

The next inspection events for an asset should be scheduled based on the condition of the bridge, the data input as part of the inspection or to adhere the agency's requirements. Table 8 details the workflow associated with requesting follow-up inspections and completing requests. To recommend a future inspection, click the "Inspection Required" checkbox. Depending on the inspection type, an inspection interval and the estimated date of the future inspection event may or may not be required to be completed. The calendar day used in the date field for the estimated date of the future inspection event shall match the date of the subject inspection field. For example, a routine inspection with a 12-month interval that has an inspection date of 04/05/2024 shall have a routine inspection scheduled with a 12 month interval and an estimated date of the future Routine Inspection of 04/05/2025. **The date of the future inspection should match the day in the month N-months in advance. Users should not use the first or last days of the month.**

When completing the Schedule section, inspection events that are no longer required for the bridge shall be removed by unchecking the "Inspection Required" checkbox.

When requesting an inspection event or removing an inspection event, the user MUST included their reason in the "Schedule Notes" textual field in the Schedule section. If the inspection event being requested has a required request, DO NOT repeat information in the "Schedule Notes" use the following text. "[Inspection Type(s) are being requested. See reason for request in Requests Group Box." If the interval is changed on an existing inspection type, state the reason why in "Schedule Notes".

**** TIP: See Table 5.2 regarding inspections that roll-up to other inspections. Both inspection types do not need to be selected. For example, if the bridge needs a Complex Routine**

inspection, a Routine Inspection does not need to be scheduled. Similarly, if a In-Depth Fatigue Inspection needs to be scheduled, an In-Depth inspection does not need to be scheduled. **

8.3 Requests

When requesting an inspection event or removing an inspection event, the user MUST include their reason in the “Schedule Notes” textual field in the Schedule section.

Table 8: Workflow Associated with Requesting Follow-up Inspections and Completing Requests				
Inspection Type	**FHWA Roll Up Inspection**	**Accompanying Request**	**Inspection Interval [1]**	**Notes**
Complex Routine/ Movable	Routine	N/A	24 Months or as required by Chapter 4 of the BIGD	A Complex Routine inspection was created to check a BITL's qualifications to confirm that the BITL performing the inspection meets SCDOT's requirement for a BITL of a bridge with a complex feature. **At the implementation of BrM, bridges with complex features will be assigned to Consultants with Routine AND Complex Routine Inspections.** During the first routine inspection, the Consultant BITL shall indicate at the inspection initiation that both a Routine and Complex Routine are being performed on the bridge. **On the Submit Page, the Consultant BITL shall remove the need for a Routine Inspection and only schedule a Complex Routine in addition to other inspection types that may be needed.**
Underwater (Unscheduled)	Underwater	Underwater Requests Group Box MUST include reason (i.e., water depth over 4') AND state locations where UW inspection is needed (i.e., Bent 4, all interior bents, etc.)	3 Months	If the BITL recommends a UW inspection on a bridge, an Underwater (Unscheduled) Inspection shall be scheduled **(not Underwater)** and the reason for the request shall be stated in the Requests Group Box. After the completion of the Underwater (Unscheduled) Inspection, the Underwater BITL shall determine if Underwater Inspections are warranted and shall schedule them. **See Section 4.1 of the BIGD, Updated in TN03 for requirements related to Underwater (Underwater) Inspections.** After the completion of the Initial Underwater Inspection, additional Underwater (Unscheduled) Inspections should not be scheduled and Underwater inspections should be scheduled, if required. **A checkbox is included if the water depth is 4' or more and the BITL does not intend to request an UW. A reason should be included in the Miscellaneous Notes section of the report.**
Inspection Procedure	N/A	Inspection Procedure If an existing inspection procedure required a revision or deletion, the existing inspection procedure shall be included in the Requests Group Box.	6 Months	If a BITL recommends the revision, addition, or deletion a Bridge Specific Inspection Procedure (BSIP) for a bridge they are inspecting, they shall schedule an Inspection Procedure Inspection Event AND complete the Inspection Procedure section of the Request Group Box. The BMO will review the request and send the inspection assignment to either the district or the Consultant assigned to that district for review and to take action, if needed.
Hydraulic Analysis	N/A	Hydraulic Analysis (HDSO) Requests Group Box shall be completed, see Notes.	9 Months	If a user needs the Hydraulic Support Design Office (HDSO) to perform a hydraulic analysis on a bridge, a Hydraulic Analysis inspection event shall be recommended and the Hydraulic Analysis section of the Requests Group Box. A Hydraulic Analysis inspection is used to update NBI Item 71 and NBI Item 113, if required.
Load Rating [2]	N/A	Load Rating Requests Group Box shall be completed, see Notes.	3 Months	TN15 of the LRGD provides specific timeline requirements for actions that must be followed when the need for a load rating is discovered. The user shall provide specific information according to the list below. □ Component Rating (NBI 58, 59, 60 or 62) (Dropped from 7 to 5 or Now Below 4) □ Advanced Deterioration to Structural Element (Include Element) (CS4) □ Change in Dead Load (Wearing Surface, Roadway Barriers, etc.) □ New/Rehabilitated Bridge (Include NBI Item 27 and/or NBI Item 106) □ Other Reason Previous Rating is Obsolete
One-Time Inspection	N/A	Testing/NDT Request	3 Months	If the BITL requests testing on a bridge (destruction or non-destructive), the dropdown field and reason for the request shall be filled out. The BMO will review the request and send the inspection assignment to either the DBE, the Materials Lab or the Consultant assigned to that district for review and to take action, if needed. The One-Time Inspection is a schedulable/assignable inspection to perform the testing. If the testing needs to be added to the BSIP after the One-Time Inspection, the BITL is responsible for adding the approved testing.

1 – The inspection interval included here are recommendations and the maximum interval allowed to be entered. The BITL is responsible for recommending a shorter interval (if needed) based on bridge needs.
2 – If an urgent load rating is required, a Critical Finding **shall** be submitted, and a load rating task shall be assigned to the Consultant PM or designee who is responsible for the load ratings in the subject district.

9 Load Ratings and Postings

9 LOAD RATINGS AND POSTINGS

This section will be updated as the DOT updates the load rating process and the use of BrM to track load ratings. Following implementation, the same process outlined in the LRGD shall be followed except that load raters will now update applicable NBI and SBI information in BrM and not BIO.

As of 2021, BrR and BrM can establish an API link to send bridge data from BrM to BrR and to return load rating information from BrR to BrM. Instructions on how to use the API link are available on SCDOT's ProjectWise, link here. BrM Version 7.3 is required to make this link.

10 Multimedia

10 MULTIMEDIA

The Multimedia Page views bridge level and inspection level files.

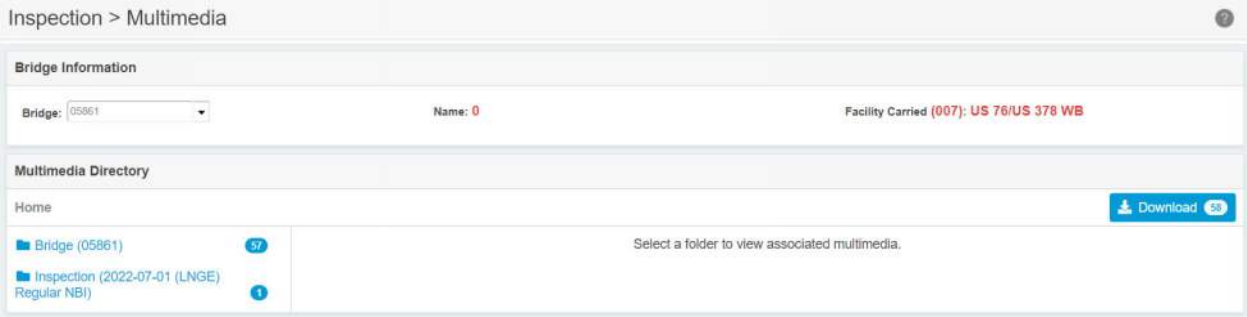


Figure 10.1 Multimedia window showing Bridge and Inspection folder levels.

10.1 Bridge Level Folder

The bridge level folder displays the files from the Bridge File on ProjectWise. The ProjectWise directory is considered the bridge's Bridge File. Files are displayed in ProjectWise as a convenience. Files are read-only and cannot be edited and saved back to ProjectWise. Please use ProjectWise to edit files. CAD Drawings (.dgn) files cannot be opened from BrM.

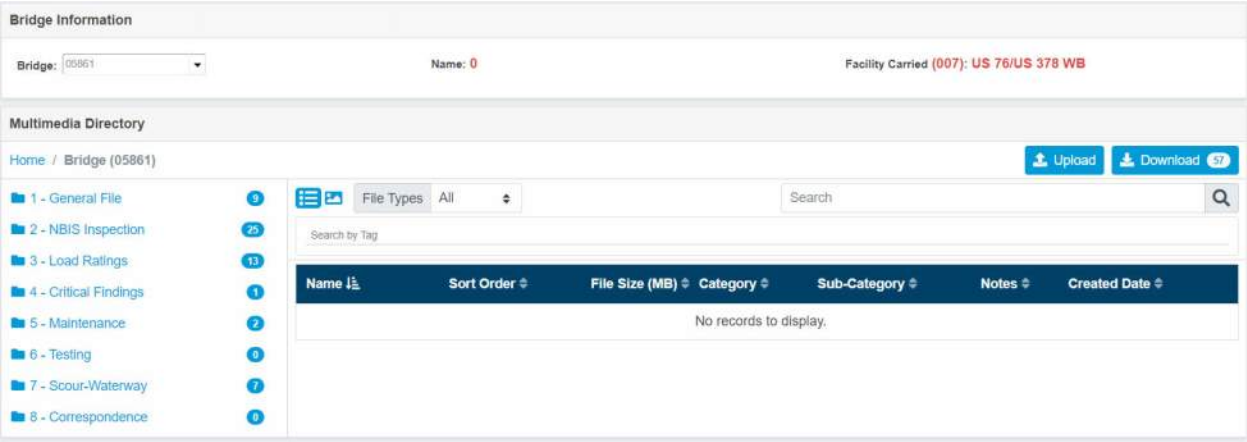


Figure 10.1.1 Multimedia window showing Bridge folder level.

10.2 Inspection Level Folder

The primary use for the inspection level folder is to store photographs and the inspection report related to the subject inspection.

Inspectors are recommended to use the Mobile application for inspections to take and upload pictures to a bridge inspection event. In the event pictures need to be added in BrM, inspectors shall upload the pictures to the inspection event folder and not the bridge folder. Photos are best viewed using the thumbnail preview versus the list view ( ).

At the completion of the inspection, the inspection report is saved in the inspection folder before being uploaded to ProjectWise by BrM.

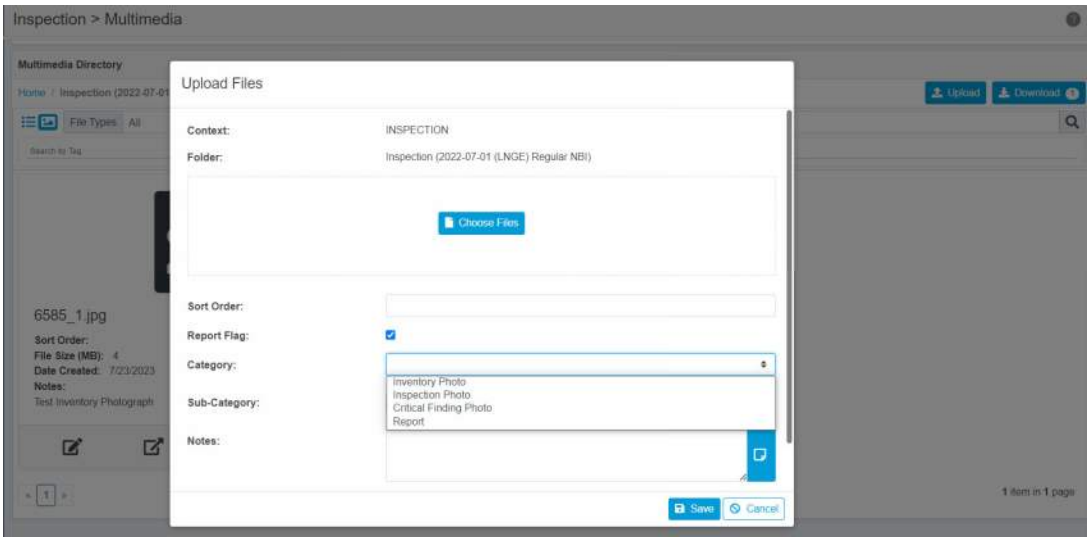


Figure 10.2.1 Multimedia window showing Inspection folder level and upload popup.

Three types of photographs can be uploaded:

- Inventory Photo
- Inspection Photo
- Critical Finding Photo

**** TIP: You are encouraged to reduce the size of your photographs for Critical Findings. See Appendix E. ****

Any photograph which has the "Report Flag" checkmark selected that uploaded to the inspection level folder will appear in the inspection report. Inventory Photos also have a preset Sub-Category which must be used for proper file storage in ProjectWise. Critical Finding Photos will be applied to a Critical Finding Report, if one is generated for the bridge. Sub-Category is not needed for Inspection Photo and Critical Finding Photo. The photo caption in the reports is the "Notes" field. A photo number is not needed in the caption, BrM will apply one automatically in the report. SCDOT currently does not use the multimedia tags feature in BrM.

If a Critical Finding is happening outside of an inspection event, users may upload photos to the Bridge level folder and the 4-Critical Findings subfolder. These photos will not be sent to ProjectWise.

***** WARNING *****

BrM will uses the native photos orientation for the orientation of the photo in the application and the reports. If you are using a mobile or tablet device, be sure to hold your camera the correct way or adjust the photos during post-processing.

11 Sketches

11 SKETCHES

11.1 Cross Sections

The BrM Cross Section module was developed by Alabama DOT; ADOT's user manual is available here. BrM has extensive guidance which is viewable by using the "?" function ( ) in the upper lefthand corner of the page.

Note: The "Bridge Cross Section" training video on ProjectWise should have included a BM (Benchmark) of the TOP OF THE DECK and not the TOP OF THE HUB RAIL.

Additional notes are added below.

- BrM references measurements back to the top of the deck. Therefore, users should enter the height of the benchmark (barrier, rail, curb) above the deck. Superstructure thickness would be equal to the thickness of the slab/deck and the beams (if any).
- Reference Curb/Rail is used to define the distance between the top of the deck and where soundings are typically measured from (top of bridge rail or top of curb). This value will be changed where the cross section is graphed to make everything relative to the deck. Note that if soundings are typically taken from the top of the bridge deck this value should be entered as the same elevation as the deck (or "0").
- The Deck value is used to define the Y-coordinate measurement for the structure detail. All values for graphing and measurements are relative to the deck. It is acceptable to have the deck elevation be set to an assumed elevation of "0". However, if it is easier to enter deck elevations from plans that can be done at the BITL's discretion. If there is a slope to the bridge the slope can be accounted for in the deck at the BITL's discretion.
- Water Surface is used to define the water surface when the cross section was taken. If the measurement is taken as soundings the water surface measurement should be entered in as a negative value measured from the top of the bridge deck.
- An Inspection Event must be linked to the Cross Section, failure to do so will result in an incomplete QC/QA for bridges with Cross Sections.
- The "Copy" buttons are helpful when bringing forward an old Streambed. "Create" will require inspectors to start from scratch.
- So long as they are the same, a Structure Detail for the left and right orientations are not required.
- All pile tips are entered in as "-100". If users are revising the pile tips based on plans or other inspection, they shall note that the pile tips are updated and include the data source in the Data Source textbox on the Structure Detail. User can edit footing details as they need to based on structure information none.
- The following fields are not required to be completed: Station EQ, Elev EQ, Highwater Elevation and Highwater Year.

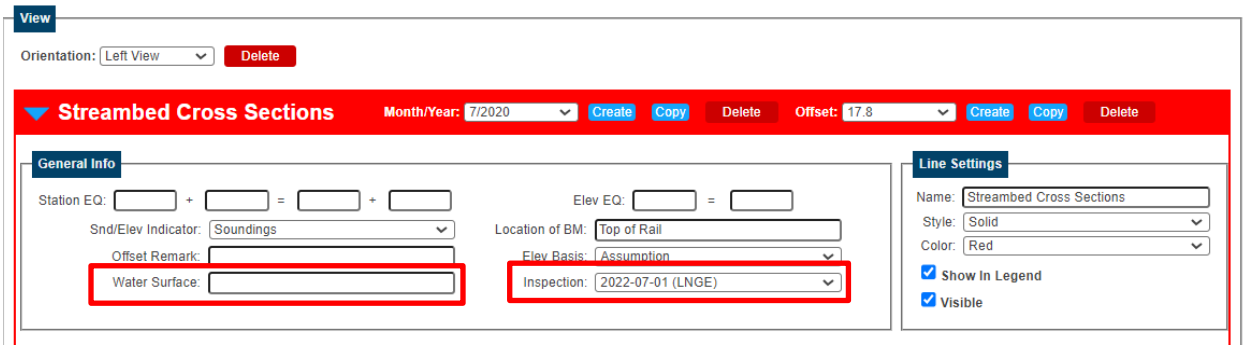


Figure 11.1.1 Cross Section Streambed Section with Water Surface and Inspection boxed.

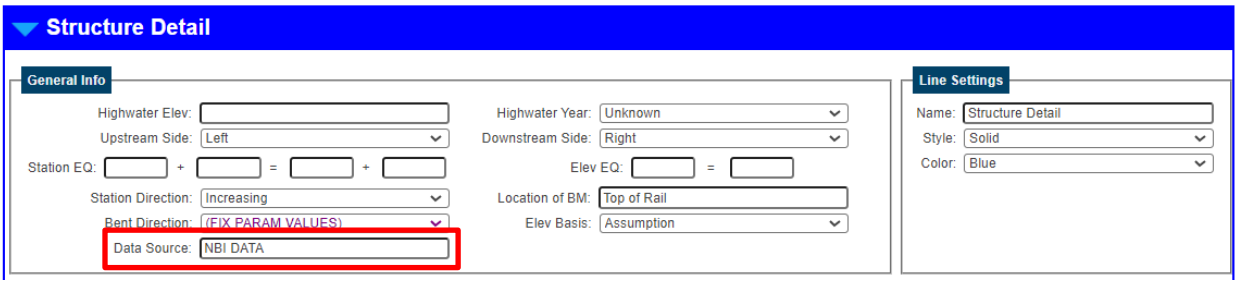


Figure 11.1.2 Cross Section Structure Detail Section with Data Source boxed.

Prior to BrM implementation, Streambed Cross Sections and Structure Detail data was pulled from BIGD Attachments A5.7 and A5.21 which were available to SCDOT. If accurate data was on the attachments, data was ported in to BrM.

If no data was provided or if the data was invalid, data was not ported in to BrM. To assist in creating the first Cross Section, NBI data was used to create dummy bridges with the same number of spans as the bridge or the same number of boxes as the culvert. However, 5' span lengths and 1' long boxes were used. Inspectors must correct the span lengths or culvert box lengths during the first inspection with a Cross Section after BrM implementation.

Station and Bent Direction

Station and Bent Direction are used to determine the direction of stationing and bent numbering and should typical both be increasing.

Location of Benchmark

Location of benchmark is used to capture the location of the benchmark used for the Cross Section. Benchmarks are typically Top of Deck, Top of Rail, Top of Barrier, Top of Curb, etc.

View Selection

Before any cross section can be entered stationing and views must be defined. The views (Right and Left are to be defined in conjunction with Bridge Orientation on the Inventory, Condition, Appraisal Page.

- Left view - data is for the left side of the bridge (when looking ahead or upstation)
- Right view - data is for the right side of the bridge (when looking ahead or upstation)

Upstream and Downstream

The Upstream and Downstream sides (right or left) of the bridge are determined when looking ahead or upstation in conjunction with Bridge Orientation on the Inventory, Condition, Appraisal Page.

Line Settings

Line settings are used to change the name, style, and color of the structure detail line. This can be used to make the line easier to see on the graph.

Crit Pile Scour Depth

The Crit Pier Scour Depth column is a place to track the Critical Pier Scour Depth, or depth at which the bent will become unstable if exposed. This value graphs itself as a small x-mark on the bent to indicate the location. This value is determined when a Hydraulic Analysis is performed on the bridge and is not the responsibility of the bridge inspectors but can be added at the BITL's discretion.

Offsets

Offsets are used to define how far away from the bridge you are for each view (right or left). Offsets must be created before a cross section can be entered. Offsets are defined starting from the upstream side of the bridge. For example, if the right side of the bridge is the upstream side the upstream cross section would be created for the right view and have a 0 offset and the downstream side would be created for the left view and have an offset equal to the width of the bridge. Offsets should be measured to the nearest foot. The offset remark field is used to help better define where the cross section was taken. Examples of this can include, "upstream side of the bridge", "25' upstream", "downstream side of the bridge", etc.…

Month and Year

Month and year are used to define when the cross section is taken. Offsets must be defined before a month and year can be entered for a cross section. Month and year should match the inspection date.

Soundings/Elevations Indicator

Sounds/Elevations Indicator dropdown indicated if the vertical measurements given in the details section are given as soundings (a distance to be subtracted from the bridge deck) or as elevations (a distance to be graphed from sea-level). **It is most common for cross sections to be taken as soundings.**

Original Streambed Elevations

Original Streambed Elevations are a cross section that marks out the original stream bed. The data entry for these follows the same guidelines as Streambed Cross Sections. The first cross section of newly constructed structures being inventoried should be entered as an original streambed elevation.

Cross Section Graph

The graph section will allow you to view multiple different cross sections and overlay them on top of each other. The graph automatically refreshes when changes to the cross section or structure detail are made however this can be toggled off by unselecting refresh automatically.

To change what is displayed on the graph you need to open the Parameters menu in the top left side of the graph window. You can change the orientation, Plot Background, and last Cross Section Color. The scale of the graph is automatically set by BrM but can be adjusted in the bottom of the Parameter menu. The graph can be printed or downloaded using the button on the top right side of the graph.

11.2 Sketch Tool

Users may create their own sketches in BrM using the Sketch Tool. Standard templates from the BIGD are included. If users require other templated to be added, please submit a ticket to the Help Desk.

11.3 Piles, Bearings and Joints

The piles, bearings and joint sketches are not required for every bridge but these sketches replace the need for sketches required by the BIGD. For example, the piles table will be required for all pile bridges with a substructure rating of Fair (5) or worse. **Pile Size/Thickness shall be entered are the CROSS SECTION AREA of the pile (in square inches) and not the diameter or size of the steel shape.** Pile Inclination shall measure the angle of the pile while considering a true vertical pile at 90 degrees. See Appendix F for guidance on timber piles.

11.4 Clearances

Bridges over roadways, navigable waterways and railroads will require portions of the Clearance Dimensions Page to be completed.

See Appendix C for instructions on the completion of the Clearances page.

12 Critical Findings and Repair Recommendations

12 CRITICAL FINDINGS AND REPAIR RECOMMENDATIONS

12.1 Critical Findings Workflow

A. Inspection Event

A1. Critical Finding During Inspection Event

Update the Inspection Event with related information for the Critical Finding (element data, traffic status, inspections notes and **photographs**).

A2. Critical Finding NOT During Inspection Event

Create an Inspection Event with related information for the Critical Finding (element data, traffic status, inspections notes and **photographs**).

- Damage Inspection – structural damage to the bridge
- Unscheduled Inspection – all other inspections

B. Photographs

Photographs for Critical Findings are added on the Inspection > Multimedia Page. Once an Inspection Event exists (Step A), you can use the Multimedia shortcut on this Inspection > Critical Findings and Repairs Items > Critical Findings Page to access the Multimedia Page. **All photographs related to Critical Findings, must have "Critical Finding Photo" selected at the Category.** The "Report Flag" checkmark is not required. Sort Order will sort the order photos appear in the Critical Finding Report. Non-photos such as sketches, HMMS reports, testing results, load rating files, diagrams, etc. can be attached to a Critical Finding but they will not appear in the Critical Finding Report.

**** TIP: You are encouraged to reduce the size of your photographs for Critical Findings. See Appendix E. ****

C. Creating a Draft Critical Finding

Any user can create a Draft Critical Finding in BrM. If not already selected, select the bridge needed a Draft Critical Finding by using the Bridges Tab. Once a bridge is selected, initiate a Critical Finding by navigating to the Inspection Tab and then the Critical Findings and Repairs Items Page. The bridge's "Critical Finding List" will appear.

Click "Create New" to Create a Draft Critical Finding

Figure 12.1.1 Critical Findings List with Multimedia shortcut and Create New boxed.

**** TIP: The Critical Findings Page updates live and has built-in automatic reporting features. For this reason, the page takes up to a minute to load and perform reporting tasks. Please be patient to let the page load and report Critical Findings. ****

D. Submitting a Draft Critical Finding

Complete the Draft Critical Finding. **Remember, photos and inspection information related to this Critical Finding should already be updated in BrM. See Step B.**

D1. User Information

BrM will automatically pull in user information in the "Reporter" fields based off your User Profile. The User Profile can be edited anytime by a user by clicking your name in the upper lefthand corner of BrM.

D2. Date and Time of Finding

BrM defaults to the date/time when the user clicked **"Create New"** update as needed. Remember, FHWA requires that Critical Findings are reported to FHWA within 24 hours of discovery. This field starts the 24 hours clock.

D3. Discovered During Inspection

This is where you will link the Inspection Event (inspection or load rating) that triggered the Critical Finding. **This field is required to link photographs to the Critical Finding Report.** Link the Inspection Event that you already had created (Step A1) or the Inspection Event that you created for this Critical Finding (Step A2).

D4. Critical Finding Category

Select how the Critical Finding was discovered:

- Maintenance – During the performance of maintenance on the bridge.
- Inspection – During a scheduled inspection on the bridge.
- Load Rating – During a load rating of the bridge.
- Other – Other, includes citizen calls, storm response, damage inspections, unscheduled inspections, etc.

D5. Initial Critical Finding Priority

Select the initial recommended priority of the Critical Finding:

- Urgent (Bridge Closure)
- Restrictive (Bridge Restriction – Lane Closure, Shoulder Closer, Weight Restriction)
- Serious (Immediate Safety Action – No Traffic Impact)
- Addressed – At the time of the Critical Finding Reporting, the Critical Finding has already been addressed by the Bridge Owner.

D5. Initial Critical Finding Priority

Select the initial recommended priority of the Critical Finding:

- Urgent (Bridge Closure)

- Restrictive (Bridge Restriction – Lane Closure, Shoulder Closer, Weight Restriction)
- Serious (Immediate Safety Action – No Traffic Impact)
- Addressed – At the time of the Critical Finding Reporting, the Critical Finding has already been addressed by the Bridge Owner.

D6. Initial Action Taken

Select the initial action taken by the Critical Finding Reporting Party:

- No Action Taken
- Close Lane(s) or Shoulder(s)
- Close Bridge
- Temporary Shoring
- Temporary Weight or Load Restriction
- Other Action – Describe any other actions taken in Critical Finding Description

**** REMEMBER: If the traffic status or other bridge information is changed as a result of Critical Finding Action (closed, lane closed, temporary shorting, weight posted, etc.), a Bridge Inspection Team Leader is required to update information on the Inspection Page of BrM. ****

D7. Bridge Owner Contact Information

The Critical Finding Report shall enter in the time/date when the Bridge Owner was contacted and contact information for the Bridge Owner.

D8. Critical Finding Description

Provide a detailed explanation of the Draft Critical Finding in the Description text box.

Figure 12.1.2 Draft Critical Findings Input.

D8. Save and Link

Press “Save” to initiate the Critical Finding Reporting. Click “Link Event” and link the linked Inspection Event (Step A) to the Critical Finding.

E. Submit the linked Inspection Event for Review

The inspection event (whether scheduled or unscheduled) should be submitted for review. The inspection event will enter the QC/QA process as detailed in this Quick Guide.

During inspection review, the inspection data cannot be updated. When complete, the inspection data will be locked in BrM and the inspection report will be generated outside of the Critical Finding process.

F. Responding to a Draft Critical Finding

The DBIS or designee responsible for the bridge will receive a notification via email that a Draft Critical Finding has been submitted in their district. The DBIS or designee will review and approve the Draft Critical Finding. **When approved, FHWA is immediately notified of the Critical Finding.** Remember, FHWA requires that Critical Findings are reported to FHWA within 24 hours of discovery.

G. Updating and Addressing a Critical Finding

The district and the BMO will get weekly reminders of unaddressed Critical Findings. Users can assign tasks such as load ratings, inspections, or maintenance work to a specific user.

**** TIP: Projects and Maintenance Items are currently not supported by SCDOT's BrM. Only assign inspections and load ratings at this time. ****

When a consultant is assigned a task, the SCDOT user must assign the task to the Consultant PM. Users are required to input comments when changing the status of the Critical Finding.

If bridge inspection data (element data, traffic status, inspections notes and **photographs**) needs to be updated as part of addressing a Critical Finding, an Unscheduled Inspection shall be initiated for the bridge by a Bridge Inspection Team Leader. See Step B; **All photographs related to Critical Findings, must have "Critical Finding Photo" selected at the Category.**

Any related inspection events shall be Linked to the Critical Finding. Tasks should be updated by users who have tasks assigned. See "My Critical Finding Outstanding Tasks" and "My Dashboard" for any tasks assigned to you as a user. Any comments related to the Critical Finding should be updated by district inspection staff, district maintenance staff or the BMO.

BrM will generate an email noting the Critical Finding was addressed.

If the DBIS or designee is notifying a non-SCDOT owner of the Critical Finding, a summary of all correspondence shall be placed in the workflow. The DBIS or designee shall follow-up with the bridge owner and updated the Critical Finding as addressed and then resolved as needed.

H. Resolving a Critical Finding

Similar to Step G: Addressing a Critical Finding

When the Critical Finding is resolved, there must be no incomplete tasks associated with the Critical Finding. BrM will generate an email noting the Critical Finding was resolved

BrM does have a "Reopen" button to reopen a resolved Critical Finding if needed.

12.2 Repair Recommendations

Work candidates are currently not available in BrM.

12.2.1 DOT Performed Inspections

SCDOT inspectors shall complete their inspection and input any repair recommendations in to HMMS. SCDOT inspectors shall print to PDF the HMMS Bridge Deficiency Report(s) for the bridge and upload the PDF(s) to the 5 – Maintenance folder in the Bridge File prior to submitting the report for review.

12.2.2 Consultant Performed Inspections

Consultant inspectors shall complete their inspection and input any repair recommendations into Attachment A5.6 of the BIGD. The Consultant shall then send A5.6 to the DBIS for review and input into HMMS. When the report ready for QC, the BITL shall confirm that one of the following file types is uploaded to the 5 – Maintenance folder in the Bridge File prior to submitting the report for review.

- Attachment A5.6 (Unsigned from DBIS) (no HMMS Bridge Deficiency Report(s) available)
- Attachment A5.6 (Signed from the DBIS) with HMMS Bridge Deficiency Report(s) from the DBIS

If an unsigned copy of A5.6 was uploaded to the Bridge File, the signed A5.6 and the HMMS Bridge Deficiency Report(s) shall be uploaded by the Consultant when they are available from the District.

The status of the consultant's repair recommendations is tracked on the Submit Page, see Section 8.1.

13 Quality Control and Quality Assurance

13 QUALITY CONTROL AND QUALITY ASSURANCE

Following the submission of an inspection report (see Section 8), BrM will review the Inspection Review configuration for the subject event. If an inspection review is required, two levels of review will be initiated per Chapter 9 of the BIGD, Quality Control (QC) and Quality Assurance (QA).

13.1 Quality Control

QC will be performed by the office, district or consultant who was responsible for the inspection event and 100% of inspections will be reviewed. Based on provided user lists, users involved in QC will be added to a designated review group. Any user in that group will have access to pending reviews by clicking Inspection > My Pending Inspection Reviews. Users cannot review their own inspection. My In-Progress Inspection Reviews indicates inspections that the user is responsible for. See Section 3 for how reviews are tracked on My Dashboard. **See Section 13.3 for a detailed description of the review process.**

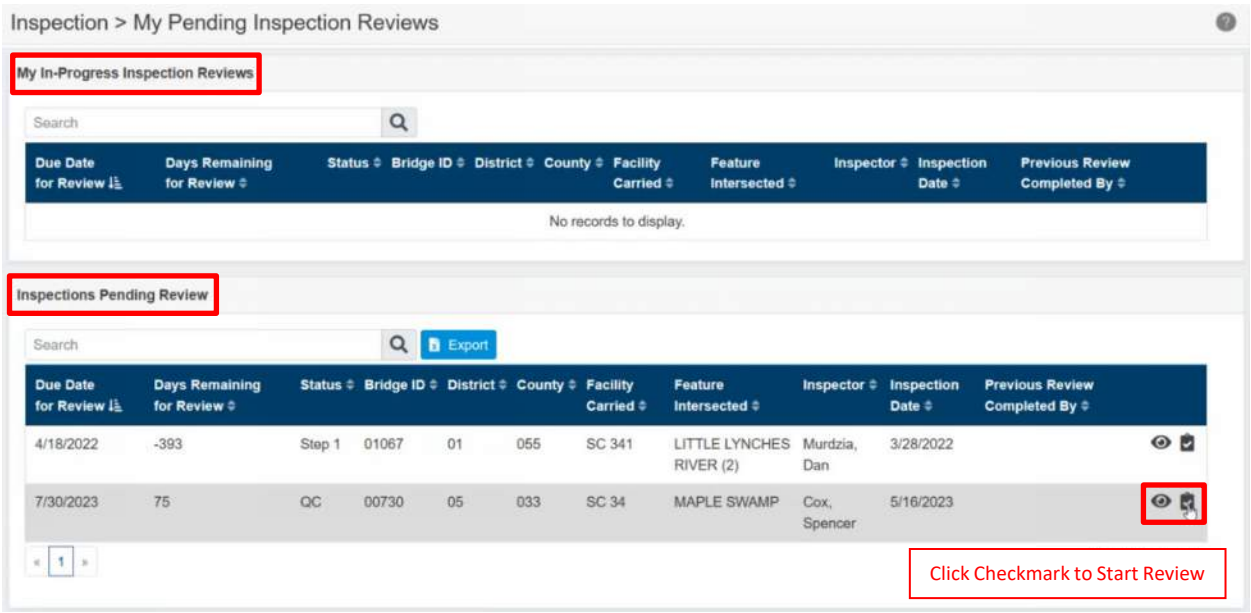


Figure 13.1.1 My Pending Inspection Reviews.

Once a user initiates a review, that user is responsible for that review step. Other users in the review group will no longer be able to perform the review.

The BrM Review Page includes all fields that must be reviewed. A checkmark or flag must be applied to every field (or row) for every inspection. Fields may also receive a discussion topic. A review cannot be progressed to the next step until all flags are cleared.

Review Icons

- Checkmark (✓) – Reviewer agrees, no comment.
- Flag (⚑) – Reviewer needs to send back to inspector, comment required.
- Discussion (💬) – Topic of discussion between reviewer and inspector, allows next step to progress.

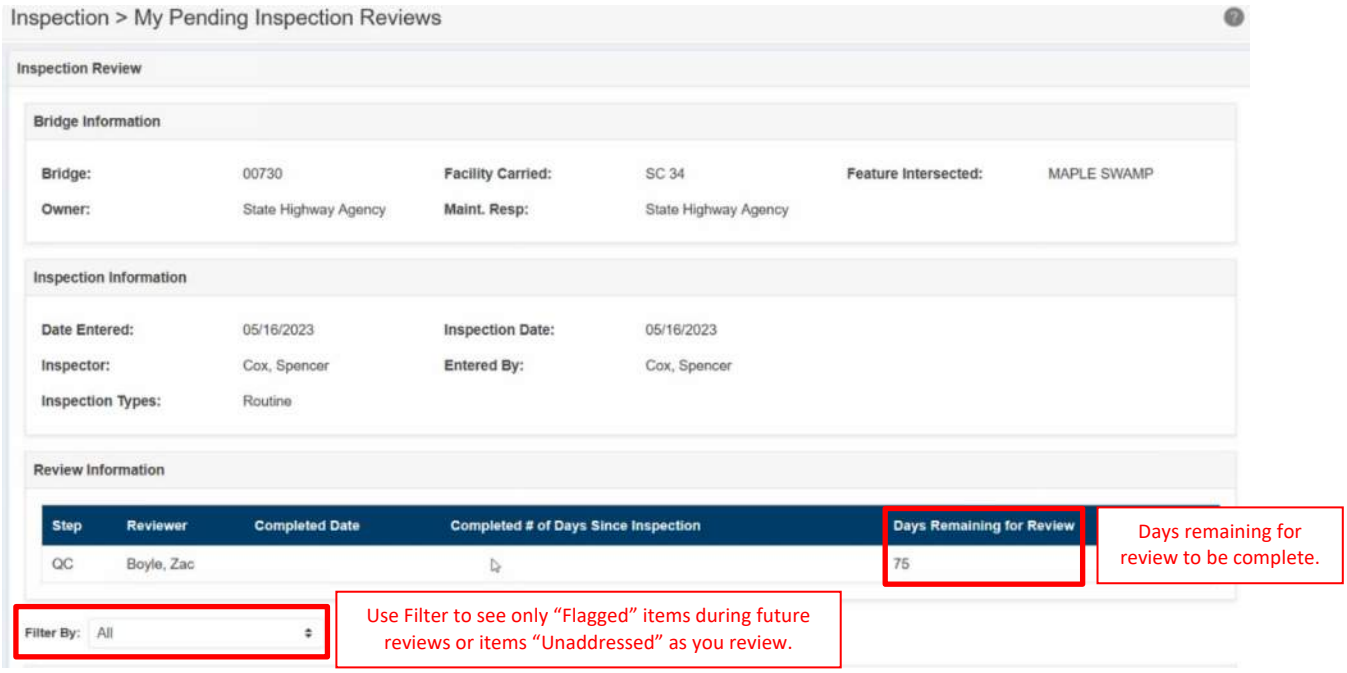


Figure 13.1.2 BrM Review Page (Header), note "Filter By".

Figure 13.1.3 BrM Review Comment Popup (Flag)

13.2 Quality Assurance

A similar process is used for QA, but a limited selection of bridges will appear for review. Most inspections will require approximately 10% of reports to be subject to QA but some may require elevated review. BrM performs automatic selection for QA. **See Section 13.3 for a detailed description of the review process.**

13.3 SCDOT BrM Inspection Review Process

1. Report Prep
    a. Users complete the inspection (Step 0). Last page to always review is the **Inspection > Submit Page**.
    b. Click "**Submit for Review**" on this page.
    c. Every time a user submits an inspection for review, BrM will automatically load the **Bridges > Validate Page**. Most times, just the bridge you are working on will be selected.

d. If more than one bridge is selected, return to your **Bridges > View List** and then click **"Unselect All"**.

e. Return to the **Submit Page** and resubmit.

f. The bridge is now submitted for QC Review. All bridges will be sent to QC.

2. QC Review

a. The inspection event is sent to the group responsible for QC. Users in this group will see the inspection listed on their **"My Pending Inspection Reviews".**

b. The assigned QC Reviewer (QCR) will click on the clipboard checkmark ( ) and the review process will be started. BrM will then identify the QCR.

c. The **Inspection Review** page will load. Note: It may be helpful for some QCRs to generate the inspection report for themselves on the Reports > Generate Page.

d. The QCR will review the selected fields and click the Check Mark for agreement, the Flag for comments or the Speech Bubbles for Discussion. ( ). **Note, please used the Speech Bubbles for quality items that should be considered for program updates for the QA Consultant and DOT to review. If you have a comment for the TL, please use the Flag.**

e. When the QC Review is complete (Step 1):

i. If there are items to address, the QCR will return inspection back Step 0 (Report Prep) by clicking **"Send Back to Previous Step"**.

1. Go to Item #3 Addressing QC Comments

ii. If there are no items to address, the QCR will click **"Submit to Next Step". This** will send the inspection to QA. or send to QA which is Step 2+.

1. Go to Item #5 QA Selection

3. Addressing QC/QA Comments

a. The returned inspection will appear on the TLs **"My Pending Inspection Reviews"**.

b. Review the Flagged or Discussion comments.

c. In addition to revising items within the report, it is suggested that a comment is provided stating the item was addressed or a reason why it was not addressed.

d. After the items are addressed return to the **Inspection > Submit Page** (See Item #1) to submit.

e. Click "**Submit for Review**" on this page.

4. QC Back Check

a. The updated inspection will appear on the QCRs **"My Pending Inspection Reviews"** page.

b. The QCR will back check all Flagged or Discussion items.

   i. If item was addressed satisfactorily, the QCR will place a check mark next to the item.

   ii. If the item was not addressed satisfactorily or requires additional updates, the QCR will return the report back to the preparer (See 2.f.i. above).

c. When all the QCRs comments have been addressed, the report is ready to go to the QA selection process.

d. The QCR will click **"Submit to Next Step"**.

5. QA Selection and Review

a. The BrM QA process is handled in many steps (Step 2+). Depending on the type of inspection, company of inspectors and bridge data, the bridge will be selected for applicable QA reviews.

b. When selected for QA, the inspection will show up only for groups identified as QA reviewers (QARs). Users in this group will see the inspection listed on their "**My Pending Inspection Reviews"**.

c. The assigned QC Reviewer (QAR) will click on the clipboard checkmark ( ) and the QA review process will be started. BrM will then identify the QAR.

d. The **Inspection Review** page will load. Note: It may be helpful for some QARs to generate the inspection report for themselves on the Reports > Generate Page.

e. When the inspection review page loads, the step identification is available in the Review Information Box.

f. The QAR will review the selected fields and click the Check Mark for agreement, the Flag for comments or the Speech Bubbles for Discussion. ( ). **Note, please used the Speech Bubbles for quality items that should be considered for program updates for the QA Consultant and DOT to review. If you have a comment for the TL, please use the Flag.**

g. When the QA Review is complete (Step 2+):

   i. If there are items to address, the QAR will return inspection back Step 1 (QC Review) by clicking **"Send Back to Previous Step"**.

      1. Go to Item #6 Transfer from QCR to TL

ii. If there are no items to address, the QAR will click **"Submit to Next Step". This** will complete the inspection and print the report.

1. Go to Item #8 Final Report

6. Transfer from QCR to TL

**** Note: The user listed as "Report Author" can also see Review Comments, the "Report to the Bridge Inspection Team Leader .****

a. If returning the inspection with comments, it will appear on the QCRs **"My Pending Inspection Reviews"**.

b. By clicking the clipboard checkmark ( ), the QCR can see that a QA Review has been started but not completed.

c. The QCR should click **"Send Back to Previous Step"** again to get the inspection report all the way back to the TL (Step 0).

d. The TL will review and address comments (See Item #3).

e. After the items are addressed return to the **Inspection > Submit Page** (See Item #1) to submit.

f. Click "**Submit for Review**" on this page.

g. The QCR will review updates. It is helpful to filter by both "Flagged" and "Discussion" to see QA comments to make sure the TL reviewed, updated, and responded.

h. The QCR will back check all Flagged or Discussion items.

i. If the items were not addressed satisfactorily or require additional updates, the QCR will return the report back to the TL, Step 0 (See 2.f.i. above).

ii. Once all items are addressed satisfactorily, the QCR will forward the report to the QAR Step 2+ (See 4.f. above).

iii. The QCR will click **"Submit to Next Step"**.

7. QAR Back Check

a. The updated inspection will appear on the QARs **"My Pending Inspection Reviews"** page.

b. The QAR will back check all Flagged or Discussion items.

i. If item was addressed satisfactorily, the QAR will place a check mark next to the item.

ii. If the item was not addressed satisfactorily or requires additional updates, the QAR will return the report back to the preparer (See 2.f.i. above).

c. When all the QARs comments have been addressed, the report is complete.

d. The QAR will click **“Submit to Next Step”**. **This** will complete the inspection report review.

8. Final Report

a. When the QAR presses “**Submit to Next Step**”, BrM will write the inspection report.

b. Depending on the size of the report (including the number of pictures) and the load on the server, it may take 90 seconds to write the report. Do not close your BrM window during this time.

c. If the QAR gets an error from BrM that the inspection report did not generate correctly, please submit a Help Desk Ticket. Link to Help Desk

13.4 Reporting

Following the completion of QA (whether the report was selected for not) will result in BrM automatically printing the bridge’s inspection report to the inspection folder on the Multimedia Page. See Section 10.1.

Users can print their own inspections reports at any time using the Reports > Generate Page and selecting the “South Carolina Inspection Report”. Users must select both the Asset ID and the inspection event. They may also generate a batch of reports using the parameters on the Generate Page.

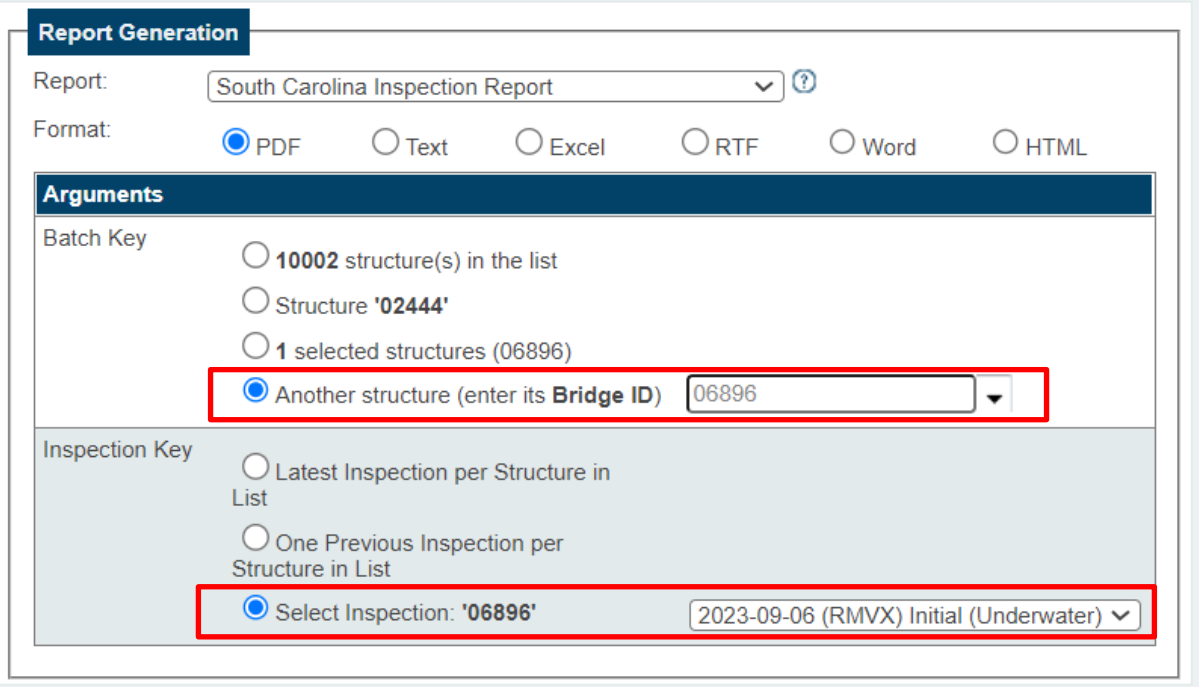


Figure 13.3.1 BrM Report Generator

13.5 Validating List of Bridges

Text, include screenshots. Use ACTIVE ONLY!

APPENDIX A. AVAILABLE EQUIPMENT IN BRM

Name	FHWA Equipment Roll-Up	Name	FHWA Equipment Roll-Up
A01 Ladder: Stepladder	A01 Ladder	I01 Ultrasonic: Steel Member	I01 Ultrasonic
A01 Ladder: Stepstool	A01 Ladder	I01 Ultrasonic: Timber Member	I01 Ultrasonic
A01 Ladder: Extension Ladder	A01 Ladder	I02 Ground-Penetrating Radar	
A01 Ladder: Other	A01 Ladder	I03 Infrared Thermography	
A02 Bucket: Under 34’ Reach	A02 Bucket Lift Vehicle	I04 Radiographic Testing	
A02 Bucket: 35’-55’ Reach	A02 Bucket Lift Vehicle	I05 Impact Echo	
A02 Bucket: Over 55’ Reach	A02 Bucket Lift Vehicle	I06 Electromagnetic Methods	
A02 Bucket: Boom Lift	A02 Bucket Lift Vehicle	I07 Rebound & Penetration Methods	
A02 Bucket: Scissor Lift	A02 Bucket Lift Vehicle	I08 Acoustic Emissions Testing	
A02 Bucket: Other	A02 Bucket Lift Vehicle	I09 Dye Penetrant	
A03 UBIU: HP35 or HPT38	A03 UBIV[1]	I10 Magnetic Particle	
A03 UBIU: HPT43	A03 UBIV[1]	I11 Eddy Current	
A03 UBIU: HPT66	A03 UBIV[1]	I12 BoD[3]: Timber Resistance Drilling	I12 Boring or Drilling
A03 UBIU: UB under 40’	A03 UBIV[1]	I12 BoD[3]: Concrete Coring/Boring	I12 Boring or Drilling
A03 UBIU: 40’-50’ UB	A03 UBIV[1]	I12 BoD[3]: Other Boring/Drill/Core	I12 Boring or Drilling
A03 UBIU: 50’-60’ UB	A03 UBIV[1]	I13 Underwater Imaging	
A03 UBIU: 60’-70’ UB	A03 UBIV[1]	IX Other: Pachometer	IX Other
A03 UBIU: UB over 70’	A03 UBIV[1]	IX Other: Sonic Testing	IX Other
A03 UBIU: Other	A03 UBIV[1]	IX Other: Spectral Analysis	IX Other
A04 Rigging: Rope Access	A04 Rigging	IX Other: Timber Vibration	IX Other
A04 Rigging: Scaffolding	A04 Rigging	IX Other: Depth finder/Fathometer	IX Other
A04 Rigging: Other	A04 Rigging	IX Other: Timber Stress Wave	IX Other
A05 Waders (Chest and Hip)	A05 Waders	IX Other: Other	IX Other
A06 Boat: John Boat w/o Motor	A06 Boat		
A06 Boat: Kayak/Canoe	A06 Boat		
A06 Boat: Motor Boat	A06 Boat		
A06: Bucket Boat/Water Lift	A06 Boat		
A07 Snorkel			
A08 SCUBA			
A09 Surface Supplied Air			
A10 Remotely Operated Vehicle (ROV)			
A11 Video Pole			
A12 Borescope			
A13 Unmanned Aerial Systems (UAS)			
AX Other: TC[2] (Shoulder Closed)	AX Other		
AX Other: TC[2] (1 Lane Closure)	AX Other		
AX Other: TC[2] (2 Lane Closure)	AX Other		
AX Other: TC[2] (Bridge Closure)	AX Other		
AX Other: Other	AX Other		

1 – UBIV = Under Bridge Inspection Vehicle
2 – TC = Traffic Control
3 – BoD = Boring or Drilling

APPENDIX B. SNBI TO NBI/SBI CONVERSION

SNBI Code	NBI/SBI Code	SNBI Data Title	BrM Table Name	BrM Column Name
B.IE.11	N/A	Inspection Note	bridge	notes
B.L.05	NBI 016	Latitude	bridge	precise_lat
B.L.06	NBI 017	Longitude	bridge	precise_lon
B.L.04	NBI 002	Highway Agency District	bridge	district
B.L.02	NBI 003	County Code	bridge	county
B.L.03	NBI 004	Place Code	bridge	placecode
B.ID.01	NBI 008	Bridge Number	bridge	struct_num
B.L.11	NBI 009	Bridge Location	bridge	location
B.CL.02	NBI 022	Maintenance Responsibility	bridge	custodian
B.CL.01	NBI 022	Owner	bridge	owner
B.W.01	NBI 027	Year Built	bridge	yearbuilt
B.LR.01	NBI 031	Design Load	bridge	designload
B.G.10	NBI 033	Bridge Median	bridge	bridgemed
B.G.11	NBI 034	Skew	bridge	skew
B.CL.04	NBI 037	Historic Significance	bridge	histsign
B.N.01	NBI 038	Navigable Waterway	bridge	navcntrol
B.N.02	NBI 039	Navigation Minimum Vertical Clearance	bridge	navvc
B.N.04	NBI 040	Navigation Channel Width	bridge	navhc
B.F.01	NBI 042A	Feature Type	bridge	servtypon
B.F.02	NBI 042B	Feature Location	bridge	servtypund
B.G.03	NBI 048	Maximum Span Length	bridge	maxspan
B.G.01	NBI 049	NBIS Bridge Length	bridge	length
B.G.07	NBI 050A	Left Curb or Sidewalk Width	bridge	lftcurbsw
B.G.08	NBI 050B	Right Curb or Sidewalk Width	bridge	rtcurbsw
B.G.05	NBI 052	Bridge Width Out-to-Out	bridge	deckwidth
B.H.13	NBI 053	Highway Minimum Vertical Clearance	bridge	vclrover
B.H.13	NBI 054A	Highway Minimum Vertical Clearance	bridge	refvuc
B.H.13	NBI 054B	Highway Minimum Vertical Clearance	bridge	vclrunder
B.H.15&14	NBI 055A	Highway Min Horizontal Clearance	bridge	refhuc
B.H.15	NBI 055B	Highway Min Horizontal Clearance, Right	bridge	hclrurt
B.H.14	NBI 056	Highway Min Horizontal Clearance, Left	bridge	hclrult
B.LR.04	NBI 063	Load Rating Method	bridge	ortype
B.LR.06	NBI 064	Operating Load Rating Factor	bridge	orload
B.LR.04	NBI 065	Load Rating Method	bridge	irtype
B.LR.05	NBI 066	Inventory Load Rating Factor	bridge	irload
B.L.08	NBI 098AA	Border Bridge State or Country Code	bridge	nstatecode
B.L.09	NBI 098B	Border Bridge Inspection Responsibility	bridge	bb_pct
B.L.07	NBI 099	Border Bridge Number	bridge	bb_brdgeid
B.W.02	NBI 106	Year Work Performed	bridge	yearrecon
B.N.03	NBI 116	Movable Bridge Max Nav Vertical Clr	bridge	lftbrnavcl

SNBI Code	NBI/SBI Code	SNBI Data Title	BrM Table Name	BrM Column Name
B.G.16	SBI 441	Calculated Deck Area	bridge	deck_area
B.ID.02	SBI 470	Bridge Name	bridge	strucname
B.L.12	SBI 475	Metropolitan Planning Organization	bridge	mpo
B.PS.01	NBI 041	Load Posting Status	inspevnt	oppostcl
B.C.01	NBI 058	Deck Condition Rating	inspevnt	dkrating
B.C.02	NBI 059	Superstructure Condition Rating	inspevnt	suprating
B.C.03	NBI 060	Substructure Condition Rating	inspevnt	subrating
B.C.09	NBI 061	Channel Condition Rating	inspevnt	chanrating
B.C.04	NBI 062	Culvert Condition Rating	inspevnt	culvrating
B.AP.02	NBI 071	Overtopping Likelihood	inspevnt	wateradeq
B.AP.01	NBI 072	Approach Roadway Alignment	inspevnt	appralign
B.N.06	NBI 111	Substructure Navigation Protection	inspevnt	pierprot
B.LR.03	SBI 859	Load Rating Date	load_rating_events	rating_date
B.H.07	NBI 011	Mile Point	roadway	kmpost
B.H.17	NBI 019	Bypass Detour Length	roadway	bypasslen
B.CL.05	NBI 020	Toll	roadway	tollfac
B.H.01&02	NBI 026	Functional Classification	roadway	funcclass
B.H.09	NBI 029	Annual Average Daily Traffic	roadway	adttotal
B.H.11	NBI 030	Year of Annual Average Daily Traffic	roadway	adtyear
B.G.09	NBI 032	Approach Roadway Width	roadway	aroadwidth
B.H.16	NBI 047	Highway Maximum Usable Surface Width	roadway	hclrinv
B.G.06	NBI 051	Bridge Width Curb-to-Curb	roadway	roadwidth
B.H.12	NBI 10	Highway Max Usable Vertical Clearance	roadway	vclrinv
B.RT.03	NBI 102	Route Direction	roadway	trafficdir
B.CL.03	NBI 105	Federal or Tribal Land Access	roadway	fedlandhwy
B.H.10	NBI 109	Annual Average Daily Truck Traffic	roadway	truckpct
B.H.04	NBI 110	National Highway Freight Network	roadway	trucknet
B.IR.04	SBI 453	Complex Feature	userinsp	bridgewithcomplex
B.C.15	SBI 600	Underwater Inspection Condition	userinsp	uw_insp_cond
B.C.09	SBI 601	Channel Protection Condition Rating	userinsp	channel_protect_cond_rate
B.G.12	SBI 619	Curved Bridge	userinsp	curved
B.C.05	SBI 602	Bridge Railing Condition Rating	userinsp	rail_cond_rate
B.C.06	SBI 603	Br Railing Transitions Condition Rating	userinsp	rail_trans_cond_rate
B.C.08	SBI 605	Bridge Joints Condition Rating	userinsp	joints_cond_rate
B.G.04	SBI 606	Minimum Span Length	userinsp	min_span_length
B.SP.03	SBI 607	Number of Beam Lines (Main)	userinsp	num_beam_lines_main
B.SP.05	SBI 608	Span Continuity (Main)	userinsp	span_cont_main
B.SP.07	SBI 609	Span Protective System (Main)	userinsp	span_prot_sys_main
B.SP.08	SBI 610	Deck Interaction (Main)	userinsp	deck_intr_main
B.SP.12	SBI 611	Deck Reinforcing Protective (Main)	userinsp	deck_rei_pro_sys_main
B.SP.13	SBI 612	Deck Stay-In-Place Forms (Main)	userinsp	deck_sip_main

SNBI Code	NBI/SBI Code	SNBI Data Title	BrM Table Name	BrM Column Name
B.C.07	SBI 604	Bridge Bearings Condition Rating	userinsp	bear_cond_rate
B.SP.03	SBI 613	Number of Beam Lines (Appr)	userinsp	num_beam_lines_appr
B.SP.05	SBI 614	Span Continuity (Appr)	userinsp	span_cont_appr
B.SP.07	SBI 615	Span Protective System (Appr)	userinsp	span_prot_sys_app
B.SP.08	SBI 616	Deck Interaction (Appr)	userinsp	deck_intr_appr
B.SP.12	SBI 617	Deck Reinforcing Protective (Appr)	userinsp	deck_rei_pro_sys_appr
B.SP.13	SBI 618	Deck Stay-In-Place Forms (Appr)	userinsp	deck_sip_appr
B.G.13	SBI 620	Maximum Bridge Height	userinsp	max_height
B.G.14	SBI 621	Sidehill Bridge	userinsp	sidehill
B.RR.01	SBI 622	Railroad Service Type	userinsp	rr_serv_type
B.W.03	SBI 623	Work Performed	userinsp	sum_work_perf
B.IR.02	SBI 630	Fatigue Details	userinsp	fatig_details
B.N.05	SBI 631	Navigation Channel Min Horizontal Clr	userinsp	nav_chan_min_horz_clr
B.LR.02	SBI 850	Design Method	userinsp	design_method

APPENDIX C. CLEARANCE PAGE GUIDANCE

The Clearance Page in BrM where inspectors document vertical and lateral clearances as well as navigation data for applicable SCDOT Structures.. Data fields that are being used to report to FHWA (NBI fields) and to SCDOT's Oversize Overweight (OSOW) permit office are automatically calculated based on user input data fields.

**** TIP: The Auto Calculated values use data values from the most recent inspection event. If a user fails to update data values in an inspection and a more recent inspection is started, the Auto Calculated values will come from the more recent inspection. Users may need to start a newer Unscheduled Inspection to get Auto Calculated values to update. ****

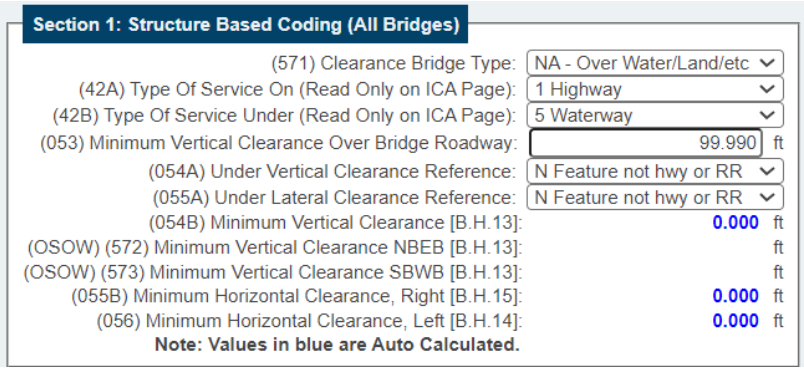
Notes:

1. The previous Clearance page utilized a dropdown selection for Route On and Route Under, with limited fields for inspectors to document clearance data based on dropdown selection. The revised clearance page allows inspectors to input and review all clearance data on a single page. The dropdown roadway selector (NBI Item 05A) only controls which route's OSOW data is presented in Section 2.
2. This Appendix C is attached to the BrM page.
3. Two database tables linked to this page are "ROADWAY" and "USERRWAY". These database tables must be set up correctly for the page to work. If a user receives errors related to those database tables, please submit a ticket to the Help Desk.
4. References from both the *Recording and Coding Guide* and the *Specifications for the National Bridge Inventory* are included on the page.
    - Clearances greater than 30 meters (98 feet) may be estimated by the inspector.
    - Report 99.9 when the clearance is 100 meters (328 feet) or greater, or if no restriction exists at bridge.
5. Travel direction is critical to determine prior to performing clearance measurements. If unclear and assumed direction is needed for future inspections, travel direction should be placed in the "Clearance Dimension Page Notes" box at the bottom of the Clearance Page.

Instructions:

1. Inspectors shall complete Section 1 for all Structures carrying a roadway regardless of if the structure crosses another route.
2. Inspectors shall complete Sections 3 and 4 if Item 042B includes a waterway or railroad. Inspectors shall complete only the applicable underclearance sections based on the feature(s) crossed by the structure. The underclearance subsections are included below. Depending on the clearance type, more than one subsection may be needed.
    - Section 5A: 2-Way Highway with Bent
    - Section 5B: 2-Way Non-Divided Highway or One Way Highway
    - Section 5C: 2-Way Highway with Median
    - Section 5D: Highway over Railroad
    - Section 5E: Clearance Bridge
    - Section 5F: Clearance Bridge (Divided Highway)
    - Section 5G: Highway over Water/Land/etc.

Section 1: Structure Based Coding (All Bridges)



SBI Item 571

SBI Item 571 (Clearance Bridge Type) has been pre-populated based on bridge data. **SBI Item 571 is to be confirmed by the bridge inspectors and shall be updated as needed.** Parameter options are included in Table C.1.

Table C.1: Parameters for SBI Item 571 (Clearance Bridge Type)

Code Value	Short Label	Description
C	Clearance Bridge	A Clearance Bridge ***('C')*** is a structure over an SCDOT-maintained roadway, which does not carry an active roadway. Clearance bridges may be a railroad over the roadway or a pedestrian bridge over the roadway.
R	Over Railroad Only	A Bridge Over a Railroad Only ***('R')*** is a bridge over only a railroad that carries an active roadway.
M	Multiple Clearance Types	Bridges over multiple clearances (i.e. roadways and railroads) shall be coded as SBI Item 571 = ***'M'***.
H	Highway Clearance Bridge	A Highway Clearance Bridge ***('H')*** is a bridge over an SCDOT route that carries an active roadway.
O	Other Clearance Config	Any other combination that does not meet another parameter may have SBI Item 571 = ***'O'***; however, this code is rare.
N	N/A (Over Water/Land/etc.)	Bridges over no clearance feature shall be coded as SBI Item 571 = ***'N'***.

NBI Item 042A, NBI Item 042B, NBI Item 053, NBI Item 54A and NBI Item 55A

NBI Item 053, NBI Item 54A and NBI Item 55A shall be coded in accordance with the *Recording and Coding Guide* and the *Specifications for the National Bridge Inventory*. NBI Item 42A and NBI Item 42B also appear in the Inventory, Condition and Appraisal (ICA) Page as read-only values. NBI Item 54A and NBI Item 55A shall be to describe the feature under the bridge, either a roadway (H), railroad (R) or another type of feature (N) such as a waterway, sidewalk without a highway or land. The feature with the smallest clearance (both vertical and horizontal) shall be used to code NBI Item 54A and NBI Item 55B.

NBI 54B, SBI Item 572 and SBI Item 573

Three vertical clearances listed below will automatically be calculate when a user presses "***Save***".

- NBI Item 54B [SNBI Item B.H.13] (Minimum Vertical Clearance) is the minimum all the Section 5 fields with the "NBI 54B" or "SNBI B.H.13" label text.
- SBI Item 572 (NBEB) and SBI Item 573 (SBWB) are used by the Oversize Overweight (OSOW) permit office.
    - SBI Item 572 is the minimum of all Section 5 fields with the "NBI 54B" or "SNBI B.H.13" label text AND have a roadway in the Northbound (NB) or Eastbound (EB) direction. **NOTE: If the route under only has one direction, only SBI Item 572 will be automatically calculated.**

- SBI Item 573 is the minimum of all Section 5 fields with the "NBI 54B" or "SNBI B.H.13" label text AND have a roadway in the Southbound (SB) or Westbound (WB) direction.

NBI Item 55B and NBI Item 56

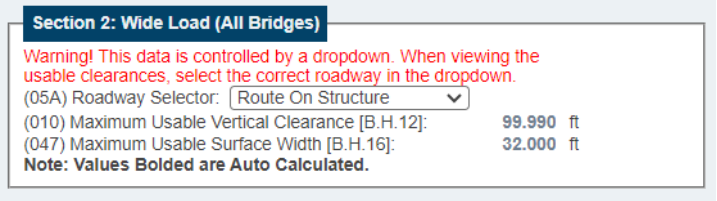
Two lateral (horizontal) clearances listed below will automatically calculate when a user presses "***Save***".

- NBI Item 55B [SNBI Item B.H.15] (Minimum Horizontal Clearance, Right) is the minimum all the Section 5 fields with the "NBI 55B" or "SNBI B.H.15" label text.
- NBI Item 56 [SNBI Item B.H.14] (Minimum Horizontal Clearance, Left) is the minimum all the Section 5 fields with the "NBI 56" or "SNBI B.H.14" label text.

Section 2: Wide Load (All Bridges)

***** WARNING *****

Section 2 on the Clearance Page is controlled by the (NBI Item 05A) Roadway Selector. When using usable (wide load) clearances, select the dropdown to see the usable clearances of the roadway on the bridge and the roadway under the bridge.

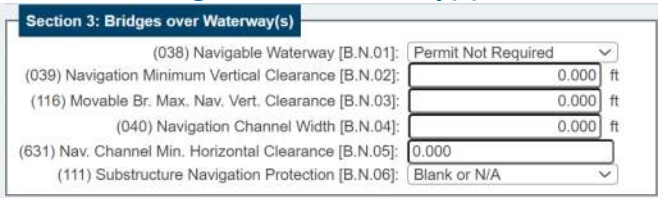


NBI Item 010 and NBI Item 047

The two wide load clearances contained in section 2 will automatically calculate when a user presses "***Save***"..

- NBI Item 010 [SNBI Item B.H.12] (Maximum Usable Vertical Clearance) is the minimum all the Section 5 fields with the NBI Item 010 [SNBI Item B.H.12] label text for the applicable roadway.
- NBI Item 047 [SNBI Item B.H.16] (Maximum Usable Surface Width) is the minimum all the Section 5 fields with the NBI Item 047 [SNBI Item B.H.16] label text for the applicable roadway.

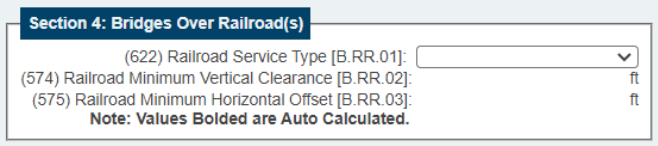
Section 3: Bridges over Waterway(s)



NBI Item 038, NBI Item 039, NBI Item 116, NBI Item 040, SBI Item 631 and NBI Item 111

NBI Item 038, NBI Item 039, NBI Item 116, NBI Item 040, SBI Item 631 and NBI Item 111 shall be coded in accordance with the *Recording and Coding Guide* and the *Specifications for the National Bridge Inventory*.

Section 4: Bridges over Railroads(s)



SBI Item 622

SBI Item 622 [SNBI Item B.RR.01] shall be coded in accordance with the *Specifications for the National Bridge Inventory*.

SBI Item 574 and SBI Item 575

Two railroad clearances listed below will automatically calculate when a user presses "Save". Automatic calculations will not transfer to the database if data is entered but the page is closed without saving.

- SBI Item 574 [SNBI Item B.RR.02] (Railroad Minimum Vertical Clearance) shall be coded in accordance with the *Specifications for the National Bridge Inventory*.
- SBI Item 575 [SNBI Item B.RR.03] (Railroad Minimum Horizontal Offset) shall be coded in accordance with the *Specifications for the National Bridge Inventory*.

Section 5 (All Subsections)

The *Specifications for the National Bridge Inventory* will eventually require clearances for all features under and on a bridge. A future version of BrM will allow for coding of clearances for all features under a bridge. In preparation for this requirement and until the new version of BrM is released, the 7 (A through G) subsections of Section 5 allow users to start documenting all these clearances.

The first group of fields in each subsection is dedicated to the Inventory Route carried by the structure and shall be completed based on the *Recording and Coding Guide*. If multiple subsections are being completed, the "Inventory Route" fields only need to be documented in the subsection containing the Under Route with the highest hierarchy as defined in BIGD Appendix M.

If the structure crosses only one route, then only one subsection needs to be completed. If the structure crosses multiple routes, then Inspectors shall complete all applicable subsection of the Clearance Page. For Example: If a bridge crosses an interstate with each direction of travel separated by a bent (Spans 3 and 4), and in adjacent spans, the bridge also crosses a railroad (Span 6) and two one-way frontage roads (Spans 2 and 5). All four features would be documented using separate subsections. Using this example bridge:

- Section 5A would be used to code the interstate clearances.
- Section 5B would be used to code the frontage road with the lowest vertical clearance, with the second's clearance information documented in the textbox in Section 5B. Note: When entering additional clearances in the text box, users should document all subsection fields for the additional route.
- Section 5D would be used to document the railroad clearances.

The fields described below are optional but encouraged to make sure that clearance measurements and locations are accurate and repeatable.

- *Minimum Vertical Clearance Controlling Member*

  Inspectors can note which member on the bridge controls the vertical clearance. This field is a freeform text field, and inspectors can add their own text. Some expected inputs for this field could be "Girder 3-1" or "Overhead Highway Sign on East Fascia".

- *Maximum Usable Vertical Clearance Location*

  Inspectors can note the location of the vertical clearance measurement. This field is a freeform text field, and inspectors can add their own text. Some expected inputs for this field could be "At Crown", "EB Lane", "WB Lane 4" or "NB White Line Between Lane 2 and 3".

- *Horizontal Clearance Controlling Member (Left and Right)*

Inspectors can note which member under the bridge controls the horizontal clearance. This field is a freeform text field, and inspectors can add their own text. Some expected inputs for this field could be "Bent 9 Column", "Concrete Barrier" or "Steep Slope on East Abutment".

Examples for some subsections are provided on the following pages. Examples may not reflect actual bridge data and are included as samples of how data shall be recorded.

Completing the section for clearance bridges is similar to the sections with the exception of completing the Inventory Route (Highway On Bridge) group box. Section 5E (Clearance Bridge) is similar to Section 5B. Section 5F (Clearance Bridge (Divided Highway)) is similar to Section 5A.

***** WARNING *****

Section 5G must be completed for all other non-clearance bridges (over water/land) to Code NBI 010 & 047.

Example for 2-Way Highway with Bent (Section 5A)

Asset ID:
3024

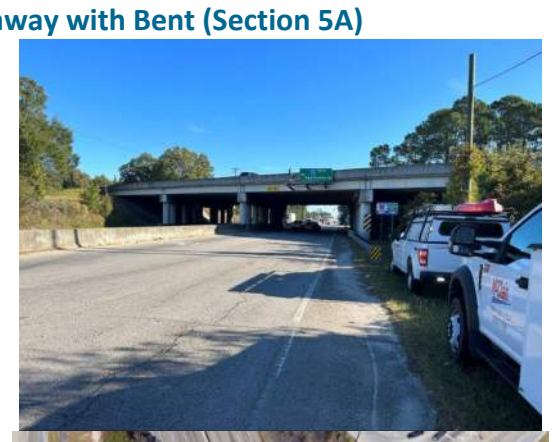
Route Over:
Interstate I-26 (EB / WB)

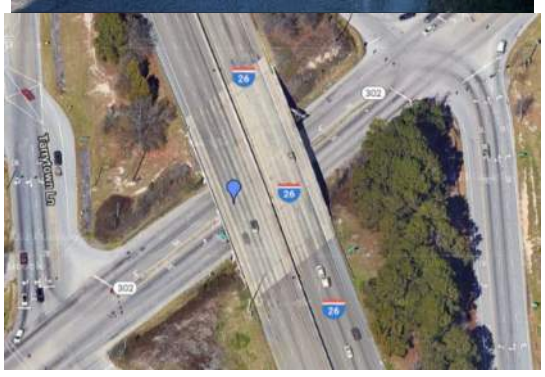
Route Under:
SC 302 (EB / WB)

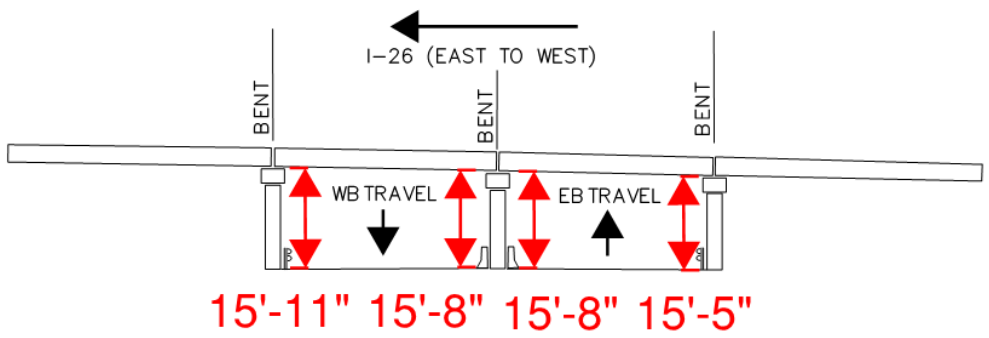
Type:
2-Way Highway with Bent

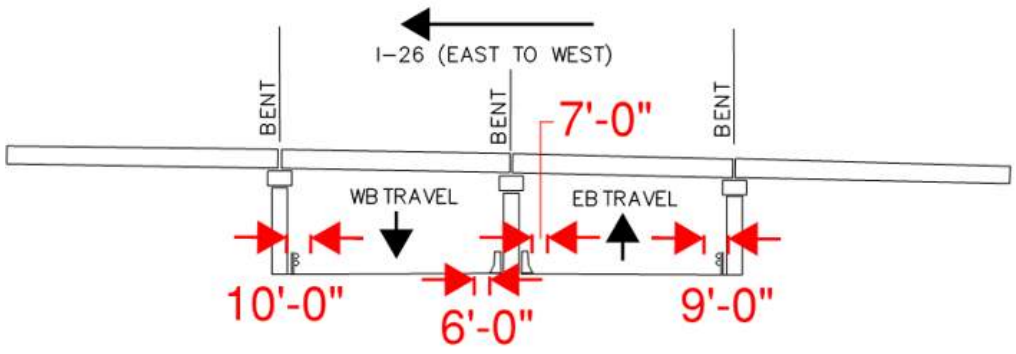
Notes:

- Divided Highway
- Bent Between Travel Directions









Sections 1, 2, 3 and 4

Section 1: Structure Based Coding (All Bridges)

(571) Clearance Bridge Type:	H - Highway Clearance Br	
(42A) Type Of Service On (Read Only on ICA Page):	1 Highway	
(42B) Type Of Service Under (Read Only on ICA Page):	1 Highway	
(053) Minimum Vertical Clearance Over Bridge Roadway:	99.990	ft
(054A) Under Vertical Clearance Reference:	H Hwy beneath struct	
(055A) Under Lateral Clearance Reference:	H Hwy beneath struct	
(054B) Minimum Vertical Clearance [B.H.13]:	15.400	ft
(OSOW) (572) Minimum Vertical Clearance NBEB [B.H.13]:	15.400	ft
(OSOW) (573) Minimum Vertical Clearance SBWB [B.H.13]:	15.600	ft
(055B) Minimum Horizontal Clearance, Right [B.H.15]:	9.000	ft
(056) Minimum Horizontal Clearance, Left [B.H.14]:	6.000	ft

Note: Values in blue are Auto Calculated.

Section 2: Wide Load (All Bridges)

Warning! This data is controlled by a dropdown. When viewing the usable clearances, select the correct roadway in the dropdown.

(05A) Roadway Selector:	Route On Structure	
(010) Maximum Usable Vertical Clearance [B.H.12]:	99.990	ft
(047) Maximum Usable Surface Width [B.H.16]:	54.000	ft

Note: Values in blue are Auto Calculated.

Section 3: Bridges over Waterway(s)

(038) Navigable Waterway [B.N.01]:	NA-no waterway	
(039) Navigation Minimum Vertical Clearance [B.N.02]:	0.000	ft
(116) Movable Br. Max. Nav. Vert. Clearance [B.N.03]:	0.000	ft
(040) Navigation Channel Width [B.N.04]:	0.000	ft
(631) Nav. Channel Min. Horizontal Clearance [B.N.05]:		
(111) Substructure Navigation Protection [B.N.06]:	Blank or N/A	

Section 4: Bridges Over Railroad(s)

(622) Railroad Service Type [B.RR.01]:		
(574) Railroad Minimum Vertical Clearance [B.RR.02]:		ft
(575) Railroad Minimum Horizontal Offset [B.RR.03]:		ft

Note: Values in blue are Auto Calculated.

Section 2A (Route Under)

Section 2: Wide Load (All Bridges)

Warning! This data is controlled by a dropdown. When viewing the usable clearances, select the correct roadway in the dropdown.

(05A) Roadway Selector:	One Route Under	
(010) Maximum Usable Vertical Clearance [B.H.12]:	15.500	ft
(047) Maximum Usable Surface Width [B.H.16]:	43.000	ft

Note: Values in blue are Auto Calculated.

Section 5A

Section 5A: 2-Way Highway With Bent

Inventory Route (Highway On Bridge)

(010) Maximum Usable Vertical Clearance [B.H.12]:	99.990	ft
(047) Maximum Usable Surface Width [B.H.16]:	54.000	ft

Vertical Clearance NB/EB (Under Bridge)

(054B) Highway Minimum Vertical Clearance [B.H.13]:	15.400	ft
(Optional) Min. Vert. Clearance Controlling Member:	Girder 3-19	
(010U) Maximum Usable Vertical Clearance [B.H.12]:	15.500	ft
(Optional) Max. Usable Vert. Clearance Location:	EB Right Lane	

Vertical Clearance SB/WB (Under Bridge)

(054B) Highway Minimum Vertical Clearance [B.H.13]:	15.600	ft
(Optional) Min. Vert. Clearance Controlling Member:	Girder 3-19	
(010U) Maximum Usable Vertical Clearance [B.H.12]:	15.700	ft
(Optional) Max. Usable Vert. Clearance Location:	WB Left Lane	

Horizontal Clearance NB/EB (Under Bridge)

(055B) Highway Min. Horizontal Clearance, Right [B.H.15]:	9.000	ft
(Optional) Horiz. Clearance Controlling Member (Right):	Bent 4 Column	
(056) Highway Min. Horizontal Clearance, Left [B.H.14]:	7.000	ft
(Optional) Horiz. Clearance Controlling Member (Left):	RC Barrier at Bent 3	
(047U) Maximum Usable Surface Width [B.H.16]:	43.000	ft

Horizontal Clearance SB/WB (Under Bridge)

(055B) Highway Min. Horizontal Clearance, Right [B.H.15]:	10.000	ft
(Optional) Horiz. Clearance Controlling Member (Right):	Bent 2 Column	
(056) Highway Min. Horizontal Clearance, Left [B.H.14]:	6.000	ft
(Optional) Horiz. Clearance Controlling Member (Left):	RC Barrier at Bent 3	
(047U) Maximum Usable Surface Width [B.H.16]:	52.000	ft

If Bridge Crosses Multiple 2-Way Highways with Bent(s), code the controlling feature to the left & others in notes below for future SNBI reporting (BrM 7.0).

Example for 2-Way Non-Divided Highway or One Way Highway (Section 5B)

Asset ID:
4270

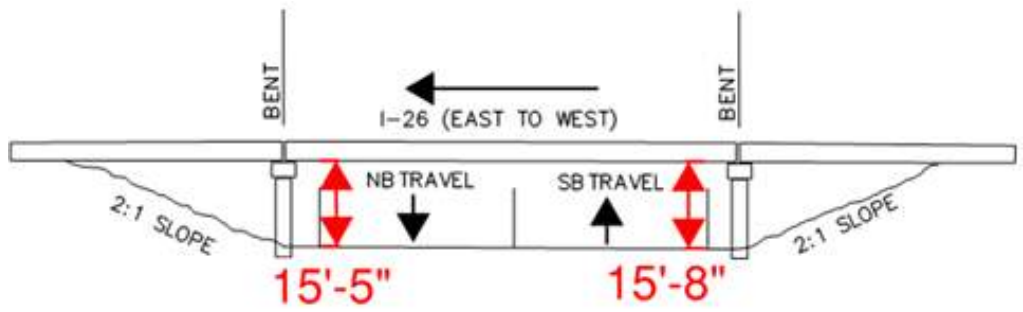
Route Over:
Interstate I-26 (EB / WB)

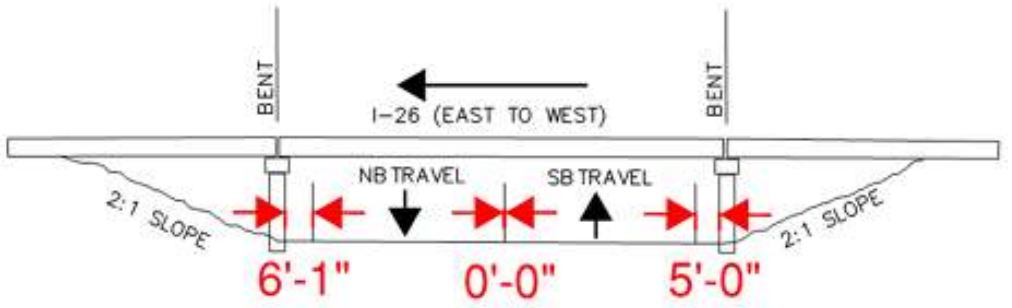
Route Under:
S-10-1187 (NB / SB)

Type:
2-Way Non-Divided Highway

Notes:

- Non-Divided Highway with Two-Way Traffic
- Lanes Separated - Double Yellow Line
- Curbs are mountable.





Sections 1, 2, 3 and 4

Section 1: Structure Based Coding (All Bridges)

(571) Clearance Bridge Type:	H - Highway Clearance Br	
(42A) Type Of Service On (Read Only on ICA Page):	1 Highway	
(42B) Type Of Service Under (Read Only on ICA Page):	1 Highway	
(053) Minimum Vertical Clearance Over Bridge Roadway:	99.990	ft
(054A) Under Vertical Clearance Reference:	H Hwy beneath struct	
(055A) Under Lateral Clearance Reference:	H Hwy beneath struct	
(054B) Minimum Vertical Clearance [B.H.13]:	15.400	ft
(OSOW) (572) Minimum Vertical Clearance NBEB [B.H.13]:	15.400	ft
(OSOW) (573) Minimum Vertical Clearance SBWB [B.H.13]:		ft
(055B) Minimum Horizontal Clearance, Right [B.H.15]:	5.000	ft
(056) Minimum Horizontal Clearance, Left [B.H.14]:	0.000	ft

Note: Values in blue are Auto Calculated.

Section 2: Wide Load (All Bridges)

Warning! This data is controlled by a dropdown. When viewing the usable clearances, select the correct roadway in the dropdown.

(05A) Roadway Selector:	Route On Structure	
(010) Maximum Usable Vertical Clearance [B.H.12]:	99.990	ft
(047) Maximum Usable Surface Width [B.H.16]:	66.000	ft

Note: Values in blue are Auto Calculated.

Section 3: Bridges over Waterway(s)

(038) Navigable Waterway [B.N.01]:	NA-no waterway	
(039) Navigation Minimum Vertical Clearance [B.N.02]:	0.000	ft
(116) Movable Br. Max. Nav. Vert. Clearance [B.N.03]:	0.000	ft
(040) Navigation Channel Width [B.N.04]:	0.000	ft
(631) Nav. Channel Min. Horizontal Clearance [B.N.05]:	0.000	
(111) Substructure Navigation Protection [B.N.06]:	Blank or N/A	

Section 4: Bridges Over Railroad(s)

(622) Railroad Service Type [B.RR.01]:		
(574) Railroad Minimum Vertical Clearance [B.RR.02]:		ft
(575) Railroad Minimum Horizontal Offset [B.RR.03]:		ft

Note: Values in blue are Auto Calculated.

Section 2A (Route Under)

Section 2: Wide Load (All Bridges)

Warning! This data is controlled by a dropdown. When viewing the usable clearances, select the correct roadway in the dropdown.

(05A) Roadway Selector:	One Route Under	
(010) Maximum Usable Vertical Clearance [B.H.12]:	15.600	ft
(047) Maximum Usable Surface Width [B.H.16]:	55.000	ft

Note: Values in blue are Auto Calculated.

Section 5B

Section 5B: 2-Way Non-Divided Highway or One Way Highway

Inventory Route (Highway On Bridge)

(010) Maximum Usable Vertical Clearance [B.H.12]:	99.990	ft
(047) Maximum Usable Surface Width [B.H.16]:	66.000	ft

Vertical Clearance (Under Bridge)

(054B) Highway Minimum Vertical Clearance [B.H.13]:	15.400	ft
(TBD) Min. Vert. Clearance Controlling Member:	Girder 2-1	
(010U) Maximum Usable Vertical Clearance [B.H.12]:	15.600	ft
(TBD) Max. Usable Vert. Clearance Location:	SB Lane	

Horizontal Clearance (Under Bridge)

(055B) Highway Min. Horizontal Clearance, Right [B.H.15]:	5.000	ft
(TBD) Horiz. Clearance Controlling Member (Right):	Bent 3 Column	
(056) Highway Min. Horizontal Clearance, Left [B.H.14]:	0.000	ft
(TBD) Horiz. Clearance Controlling Member (Left):		
(047U) Maximum Usable Surface Width [B.H.16]:	55.000	ft

If Bridge Crosses Multiple 2-Way Non-Divided Highways or One Way Highways, code the controlling feature and others in notes below for future SNBI reporting (BrM 7.0).

Example for 2-Way Highway With Median (Section 5C)

Asset ID:
8421

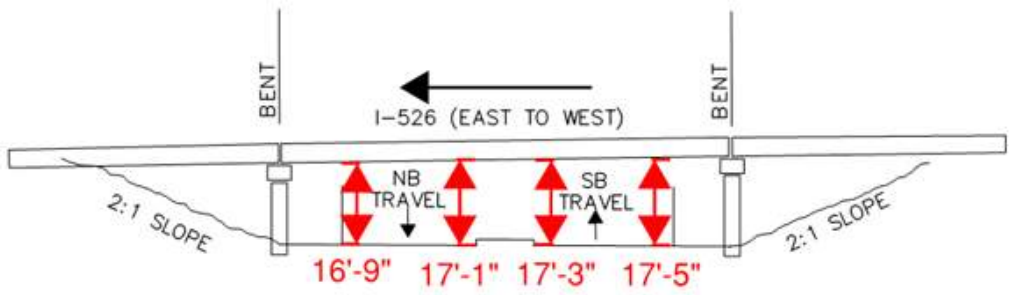
Route Over:
Interstate I-526 EB

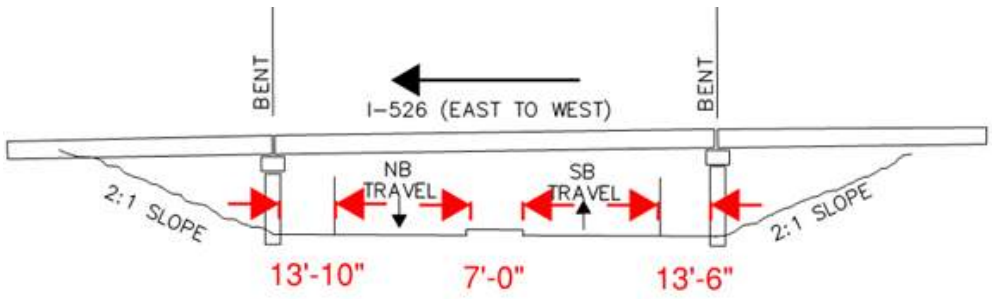
Route Under:
US 17 (NB / SB)

Type:
2-Way Highway With Median

Notes:

- Divided Highway with Two-Way Traffic
- Median Between Travel Directions
- Curbs are mountable.





Sections 1, 2, 3 and 4

Section 1: Structure Based Coding (All Bridges)

(571) Clearance Bridge Type:	H - Highway Clearance Br	
(42A) Type Of Service On (Read Only on ICA Page):	1 Highway	
(42B) Type Of Service Under (Read Only on ICA Page):	1 Highway	
(053) Minimum Vertical Clearance Over Bridge Roadway:	99.990	ft
(054A) Under Vertical Clearance Reference:	H Hwy beneath struct	
(055A) Under Lateral Clearance Reference:	H Hwy beneath struct	
(054B) Minimum Vertical Clearance [B.H.13]:	**16.800**	ft
(OSOW) (572) Minimum Vertical Clearance NBEB [B.H.13]:	**17.300**	ft
(OSOW) (573) Minimum Vertical Clearance SBWB [B.H.13]:	**16.800**	ft
(055B) Minimum Horizontal Clearance, Right [B.H.15]:	**13.500**	ft
(056) Minimum Horizontal Clearance, Left [B.H.14]:	**7.000**	ft

Note: Values in blue are Auto Calculated.

Section 2: Wide Load (All Bridges)

Warning! This data is controlled by a dropdown. When viewing the usable clearances, select the correct roadway in the dropdown.

(05A) Roadway Selector:	Route On Structure	
(010) Maximum Usable Vertical Clearance [B.H.12]:	**99.990**	ft
(047) Maximum Usable Surface Width [B.H.16]:	**54.000**	ft

Note: Values in blue are Auto Calculated.

Section 3: Bridges over Waterway(s)

(038) Navigable Waterway [B.N.01]:	NA-no waterway	
(039) Navigation Minimum Vertical Clearance [B.N.02]:	0.000	ft
(116) Movable Br. Max. Nav. Vert. Clearance [B.N.03]:	0.000	ft
(040) Navigation Channel Width [B.N.04]:	0.000	ft
(631) Nav. Channel Min. Horizontal Clearance [B.N.05]:	0.000	
(111) Substructure Navigation Protection [B.N.06]:	Blank or N/A	

Section 4: Bridges Over Railroad(s)

(622) Railroad Service Type [B.RR.01]:		
(574) Railroad Minimum Vertical Clearance [B.RR.02]:		ft
(575) Railroad Minimum Horizontal Offset [B.RR.03]:		ft

Note: Values in blue are Auto Calculated.

Section 2A (Route Under)

Section 2: Wide Load (All Bridges)

Warning! This data is controlled by a dropdown. When viewing the usable clearances, select the correct roadway in the dropdown.

(05A) Roadway Selector:	One Route Under	
(010) Maximum Usable Vertical Clearance [B.H.12]:	**17.000**	ft
(047) Maximum Usable Surface Width [B.H.16]:	**117.000**	ft

Note: Values in blue are Auto Calculated.

Section 5C

Section 5C: 2-Way Highway With Median

Inventory Route (Highway On Bridge)

(010) Maximum Usable Vertical Clearance [B.H.12]:	99.990	ft
(047) Maximum Usable Surface Width [B.H.16]:	54.000	ft

Vertical Clearance NB/EB (Under Bridge)

(054B) Highway Minimum Vertical Clearance [B.H.13]:	17.300	ft
(TBD) Min. Vert. Clearance Controlling Member:	Girder 2-1	
(010U) Maximum Usable Vertical Clearance [B.H.12]:	17.400	ft
(TBD) Max. Usable Vert. Clearance Location:	SB Right Lane	

Vertical Clearance SB/WB (Under Bridge)

(054B) Highway Minimum Vertical Clearance [B.H.13]:	16.800	ft
(TBD) Min. Vert. Clearance Controlling Member:	Girder 2-1	
(010U) Maximum Usable Vertical Clearance [B.H.12]:	17.000	ft
(TBD) Max. Usable Vert. Clearance Location:	NB Left Lane	

Horizontal Clearance NB/EB (Under Bridge)

(055B) Highway Min. Horizontal Clearance, Right [B.H.15]:	13.500	ft
(TBD) Horiz. Clearance Controlling Member (Right):	Bent 2 Column	
(047U) Maximum Usable Surface Width [B.H.16]:	117.000	ft

Horizontal Clearance SB/WB (Under Bridge)

(055B) Highway Min. Horizontal Clearance, Right [B.H.15]:		ft
(TBD) Horiz. Clearance Controlling Member (Right):	Bent 3 Column	
(047U) Maximum Usable Surface Width [B.H.16]:	117.000	ft

Horizontal Clearance (Shared) (Under Bridge)

(056) Highway Min. Horizontal Clearance, Left [B.H.14]:	7.000	ft
(TBD) Horiz. Clearance Controlling Member (Shared):	Median	

If Bridge Crosses Multiple 2-Way Highways with Median(s), code: the controlling feature and type others below::

Example for Highway over Railroad (Section 5D)

Asset ID:
715

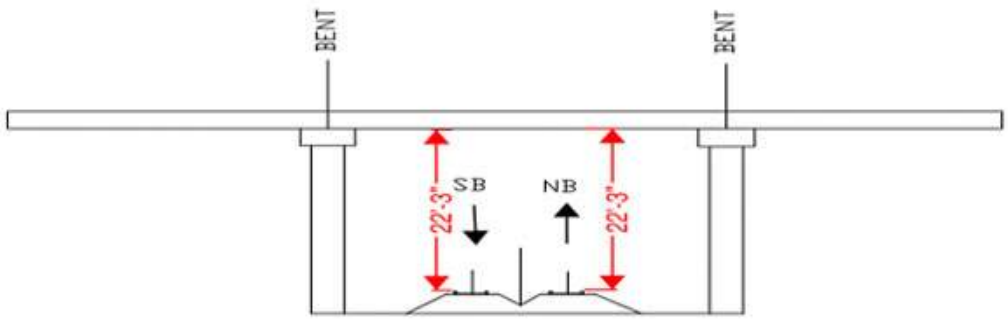
Route Over:
SC 61 (NB / SB)

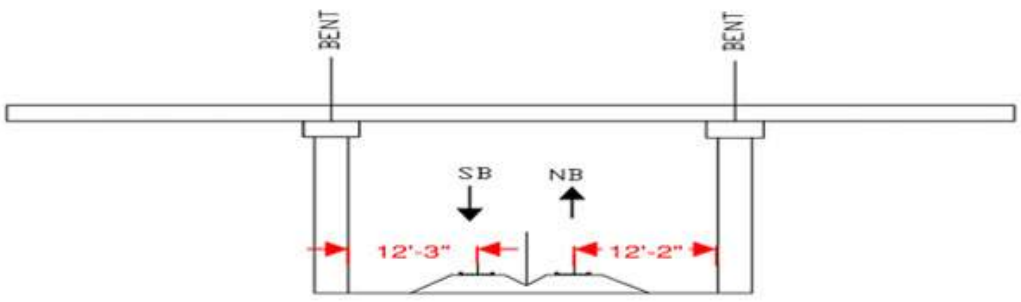
Route Under:
CSXT RR

Type:
Highway over Railroad

Notes:

- Assume there is a NB track and SB track for the purpose of determining clearances.
- Non-Divided Railroad with Two-Way Traffic
- Tracks Not Separated by Bent





Sections 1, 2, 3 and 4

Section 1: Structure Based Coding (All Bridges)

(571) Clearance Bridge Type:	R - Over Railroad Only	
(42A) Type Of Service On (Read Only on ICA Page):	1 Highway	
(42B) Type Of Service Under (Read Only on ICA Page):	2 Railroad	
(053) Minimum Vertical Clearance Over Bridge Roadway:	99.990	ft
(054A) Under Vertical Clearance Reference:	R Railroad beneath struc	
(055A) Under Lateral Clearance Reference:	R Railroad beneath struc	
(054B) Minimum Vertical Clearance [B.H.13]:	22.200	ft
(OSOW) (572) Minimum Vertical Clearance NBEB [B.H.13]:	22.200	ft
(OSOW) (573) Minimum Vertical Clearance SBWB [B.H.13]:		ft
(055B) Minimum Horizontal Clearance, Right [B.H.15]:	12.200	ft
(056) Minimum Horizontal Clearance, Left [B.H.14]:	12.200	ft

Note: Values in blue are Auto Calculated.

Section 2: Wide Load (All Bridges)

Warning! This data is controlled by a dropdown. When viewing the usable clearances, select the correct roadway in the dropdown.

(05A) Roadway Selector:	Route On Structure	
(010) Maximum Usable Vertical Clearance [B.H.12]:	99.990	ft
(047) Maximum Usable Surface Width [B.H.16]:	24.000	ft

Note: Values in blue are Auto Calculated.

Section 3: Bridges over Waterway(s)

(038) Navigable Waterway [B.N.01]:	NA-no waterway	
(039) Navigation Minimum Vertical Clearance [B.N.02]:	0.000	ft
(116) Movable Br. Max. Nav. Vert. Clearance [B.N.03]:	0.000	ft
(040) Navigation Channel Width [B.N.04]:	0.000	ft
(631) Nav. Channel Min. Horizontal Clearance [B.N.05]:	0.000	
(111) Substructure Navigation Protection [B.N.06]:	Blank or N/A	

Section 4: Bridges Over Railroad(s)

(622) Railroad Service Type [B.RR.01]:	F - Freight	
(574) Railroad Minimum Vertical Clearance [B.RR.02]:	22.200	ft
(575) Railroad Minimum Horizontal Offset [B.RR.03]:	12.200	ft

Note: Values in blue are Auto Calculated.

Section 2A (Route Under)

N/A

Section 5D

Section 5D: Highway over Railroad

Inventory Route (Highway On Bridge)

(010) Maximum Usable Vertical Clearance [B.H.12]:	99.990	ft
(047) Maximum Usable Surface Width [B.H.16]:	24.000	ft

Vertical Clearance (Under Bridge)

(054B) Railroad Minimum Vertical Clearance [B.RR.02]:	22.200	ft
(TBD) Min. Vert. Clearance Controlling Member:	Girder 2-4	

Horizontal Clearance (Under Bridge)

(055B) Railroad Minimum Horizontal Offset, Right [B.RR.03]:	12.200	ft
(TBD) Horiz. Clearance Controlling Member (Right):	Bent 3 Column	
(056) Railroad Minimum Horizontal Offset, Left [B.RR.03]:	12.200	ft
(TBD) Horiz. Clearance Controlling Member (Left):	Bent 2 Column	

If Bridge Crosses Multiple Railroads, code:
the controlling feature and type others below::

Example for Bridge with Multiple Routes Under

Asset ID:
4065

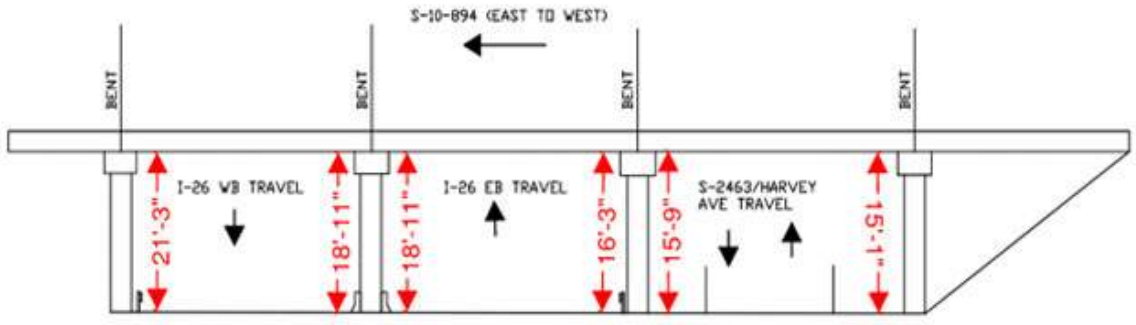
Route Over:
S-10-894

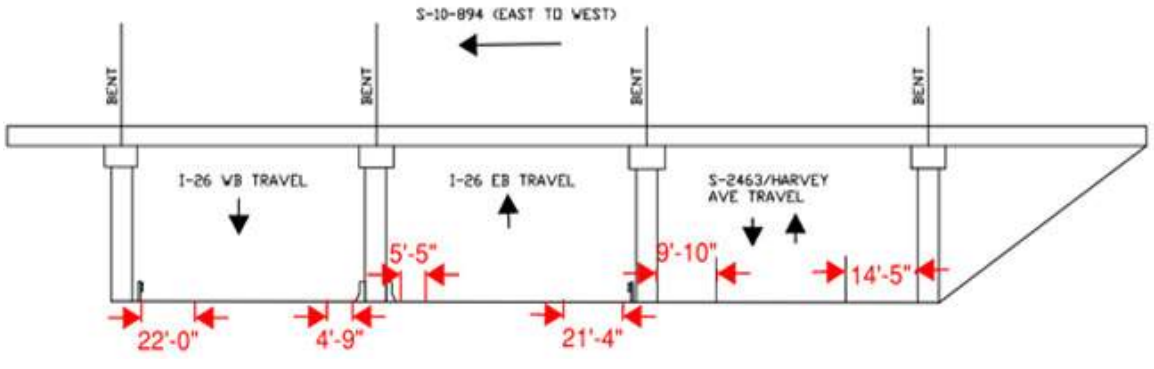
Route Under:
I-26 & S-10 - 2463/Harvey Ave

Type:
Multiple Routes Under

Notes:

- Divided Highway and Non-Divided Highway
- Bent Between Travel Directions and Routes Travel Directions





Sections 1, 2, 3 and 4

Section 1: Structure Based Coding (All Bridges)

(571) Clearance Bridge Type:	M - Multiple Clr Types	
(42A) Type Of Service On (Read Only on ICA Page):	1 Highway	
(42B) Type Of Service Under (Read Only on ICA Page):	1 Highway	
(053) Minimum Vertical Clearance Over Bridge Roadway:	99.990	ft
(054A) Under Vertical Clearance Reference:	H Hwy beneath struct	
(055A) Under Lateral Clearance Reference:	H Hwy beneath struct	
(054B) Minimum Vertical Clearance [B.H.13]:	15.100	ft
(OSOW) (572) Minimum Vertical Clearance NBEB [B.H.13]:	15.100	ft
(OSOW) (573) Minimum Vertical Clearance SBWB [B.H.13]:	18.900	ft
(055B) Minimum Horizontal Clearance, Right [B.H.15]:	14.400	ft
(056) Minimum Horizontal Clearance, Left [B.H.14]:	4.700	ft

Note: Values in blue are Auto Calculated.

Section 2: Wide Load (All Bridges)

Warning! This data is controlled by a dropdown. When viewing the usable clearances, select the correct roadway in the dropdown.

(05A) Roadway Selector:	Route On Structure	
(010) Maximum Usable Vertical Clearance [B.H.12]:	99.990	ft
(047) Maximum Usable Surface Width [B.H.16]:	50.000	ft

Note: Values in blue are Auto Calculated.

Section 3: Bridges over Waterway(s)

(038) Navigable Waterway [B.N.01]:	NA-no waterway	
(039) Navigation Minimum Vertical Clearance [B.N.02]:	0.000	ft
(116) Movable Br. Max. Nav. Vert. Clearance [B.N.03]:	0.000	ft
(040) Navigation Channel Width [B.N.04]:	0.000	ft
(631) Nav. Channel Min. Horizontal Clearance [B.N.05]:		
(111) Substructure Navigation Protection [B.N.06]:	Blank or N/A	

Section 4: Bridges Over Railroad(s)

(622) Railroad Service Type [B.RR.01]:		
(574) Railroad Minimum Vertical Clearance [B.RR.02]:		ft
(575) Railroad Minimum Horizontal Offset [B.RR.03]:		ft

Note: Values in blue are Auto Calculated.

Section 2A (Route Under)

Section 2: Wide Load (All Bridges)

Warning! This data is controlled by a dropdown. When viewing the usable clearances, select the correct roadway in the dropdown.

(05A) Roadway Selector:	One Route Under	
(010) Maximum Usable Vertical Clearance [B.H.12]:	15.700	ft
(047) Maximum Usable Surface Width [B.H.16]:	37.000	ft

Note: Values in blue are Auto Calculated.

Section 5B

Section 5B: 2-Way Non-Divided Highway or One Way Highway

Inventory Route (Highway On Bridge)

(010) Maximum Usable Vertical Clearance [B.H.12]:	99.990	ft
(047) Maximum Usable Surface Width [B.H.16]:	50.000	ft

Vertical Clearance (Under Bridge)

(054B) Highway Minimum Vertical Clearance [B.H.13]:	15.100	ft
(TBD) Min. Vert. Clearance Controlling Member:	Girder 4-1	
(010U) Maximum Usable Vertical Clearance [B.H.12]:	15.700	ft
(TBD) Max. Usable Vert. Clearance Location:	WB Lane	

Horizontal Clearance (Under Bridge)

(055B) Highway Min. Horizontal Clearance, Right [B.H.15]:	14.400	ft
(TBD) Horiz. Clearance Controlling Member (Right):	Bent 5 Column	
(056) Highway Min. Horizontal Clearance, Left [B.H.14]:	9.800	ft
(TBD) Horiz. Clearance Controlling Member (Left):		
(047U) Maximum Usable Surface Width [B.H.16]:	37.000	ft

If Bridge Crosses Multiple 2-Way Non-Divided Highways or One Way Highways, code the controlling feature and others in notes below for future SNBI reporting (BrM 7.0).

Example for Bridge with Multiple Routes Under (continued)

Section 5A

Section 5A: 2-Way Highway With Bent

Inventory Route (Highway On Bridge)

(010) Maximum Usable Vertical Clearance [B.H.12]:	99.990	ft
(047) Maximum Usable Surface Width [B.H.16]:	50.000	ft

Vertical Clearance NB/EB (Under Bridge)

(054B) Highway Minimum Vertical Clearance [B.H.13]:	16.200	ft
(Optional) Min. Vert. Clearance Controlling Member:	Girder 3-1	
(010U) Maximum Usable Vertical Clearance [B.H.12]:	18.900	ft
(Optional) Max. Usable Vert. Clearance Location:	EB Left Lane	

Vertical Clearance SB/WB (Under Bridge)

(054B) Highway Minimum Vertical Clearance [B.H.13]:	18.900	ft
(Optional) Min. Vert. Clearance Controlling Member:	Girder 2-1	
(010U) Maximum Usable Vertical Clearance [B.H.12]:	21.000	ft
(Optional) Max. Usable Vert. Clearance Location:	WB Right Lane	

Horizontal Clearance NB/EB (Under Bridge)

(055B) Highway Min. Horizontal Clearance, Right [B.H.15]:	21.300	ft
(Optional) Horiz. Clearance Controlling Member (Right):	Bent 4 Column	
(056) Highway Min. Horizontal Clearance, Left [B.H.14]:	5.500	ft
(Optional) Horiz. Clearance Controlling Member (Left):	Bent 3 Column	
(047U) Maximum Usable Surface Width [B.H.16]:	48.000	ft

Horizontal Clearance SB/WB (Under Bridge)

(055B) Highway Min. Horizontal Clearance, Right [B.H.15]:	22.000	ft
(Optional) Horiz. Clearance Controlling Member (Right):	Bent 2 Column	
(056) Highway Min. Horizontal Clearance, Left [B.H.14]:	4.700	ft
(Optional) Horiz. Clearance Controlling Member (Left):	Bent 3 Column	
(047U) Maximum Usable Surface Width [B.H.16]:	48.000	ft

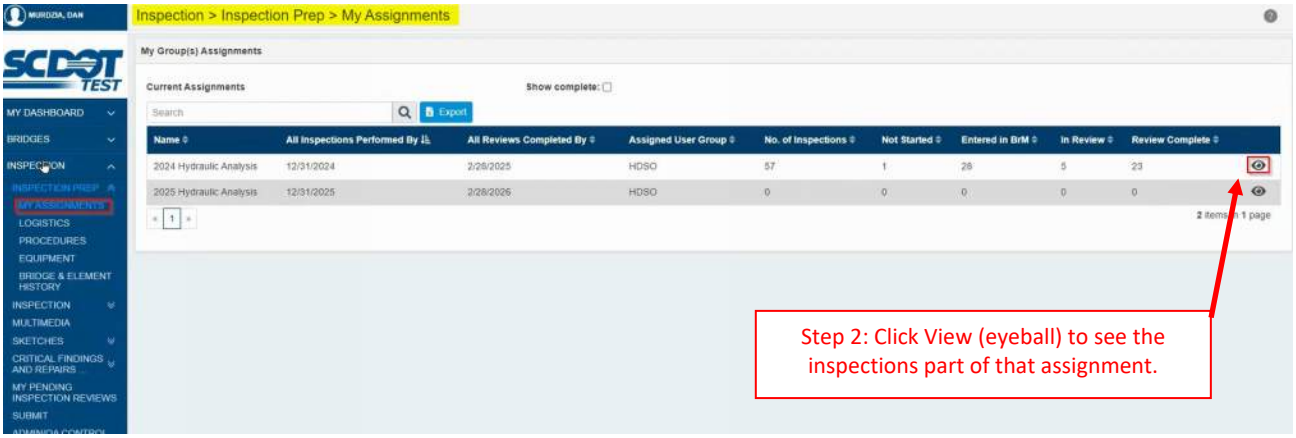
If Bridge Crosses Multiple 2-Way Highways with Bent(s), code the controlling feature to the left & others in notes below for future SNBI reporting (BrM 7.0).

APPENDIX D. HDSO HYDRAULIC ANALYSIS INSPECTION GUIDANCE

This appendix the outlines the process for engineers from the Hydraulic Design Support Office (HDSO) to perform hydraulic analysis inspection types in BrM. There is also an accompanying video to this appendix on SCDOT ProjectWise.

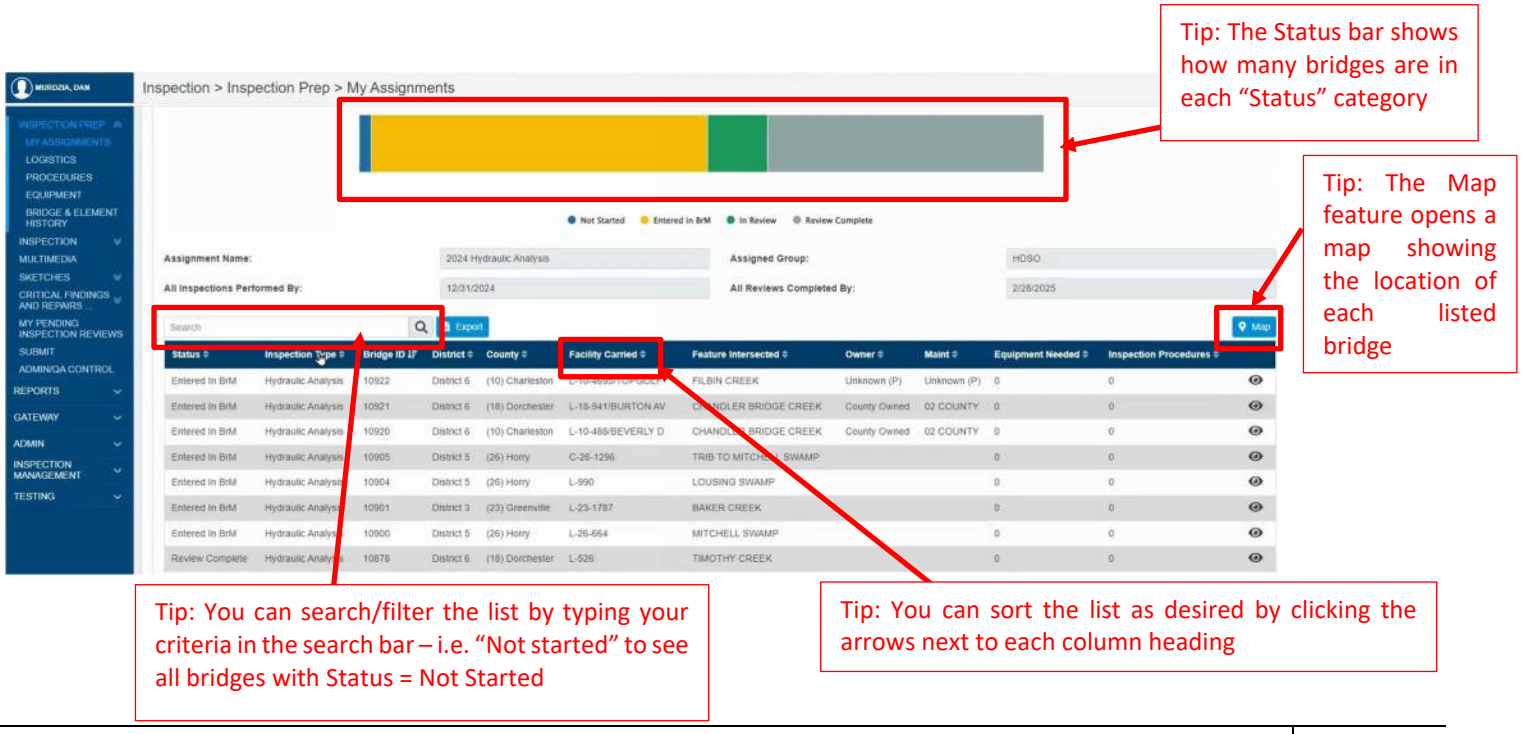
Step 1: Inspection > Inspection Prep > My Assignments

Navigate to the My Assignments Page under the Inspection Tab and the Inspection Prep Subtab. This page displays all the inspection assignments which are applicable to your user group.

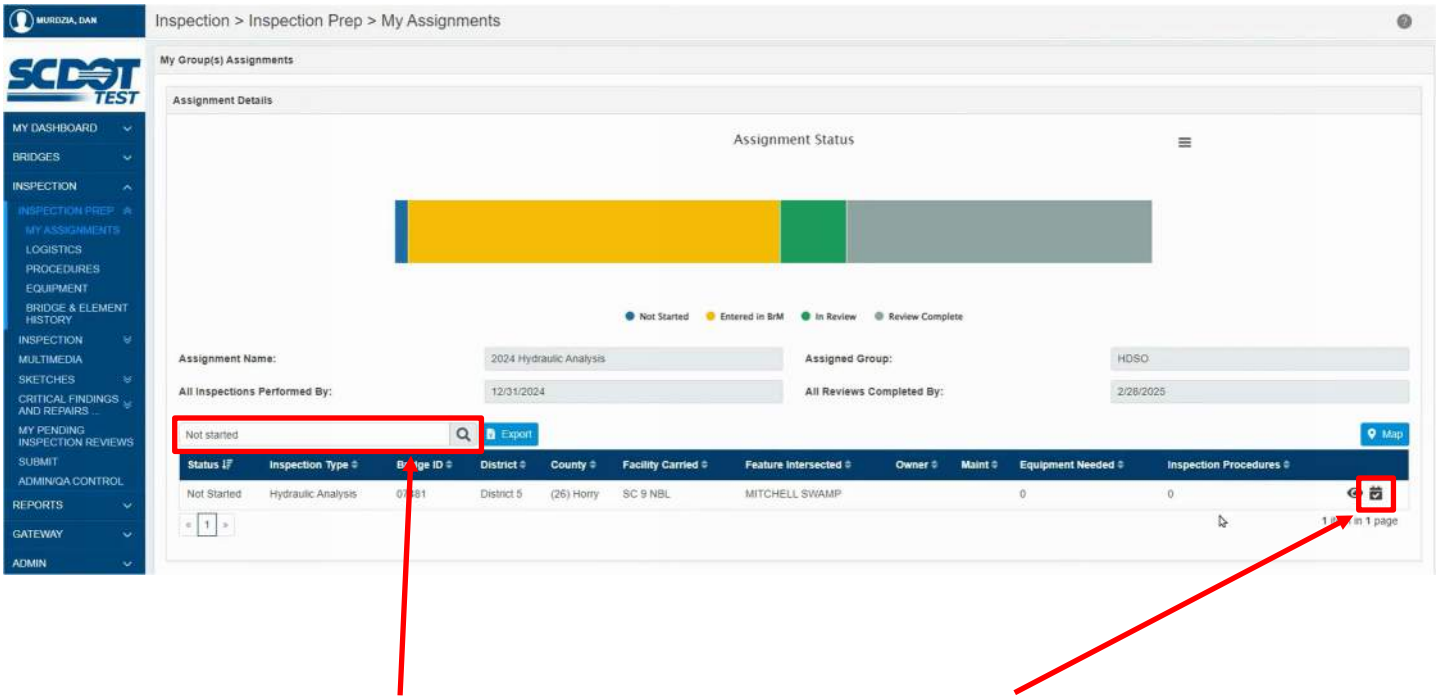


Step 2: Inspection > Inspection Prep > My Assignments

Click VIEW (eyeball), located in the far-right column, to open the list of inspections within that assignment.

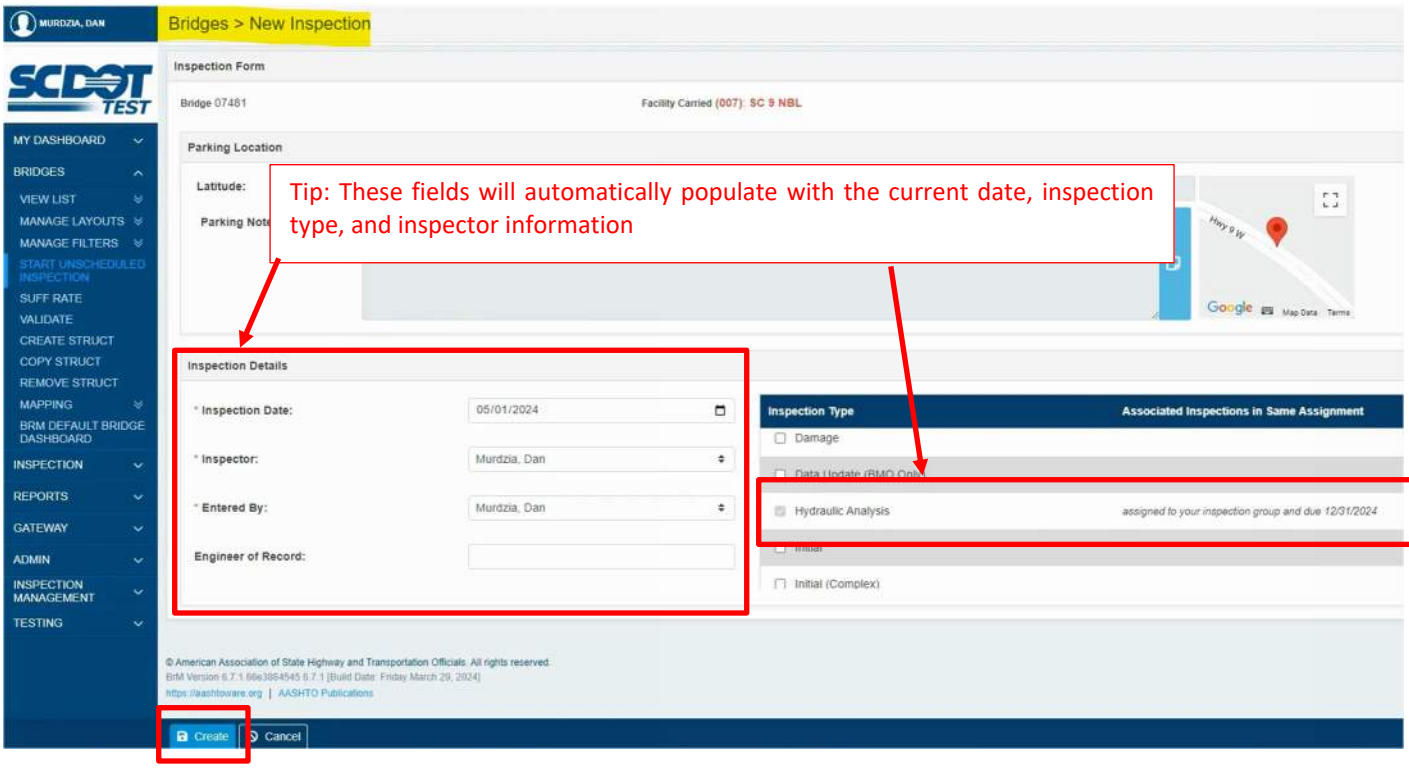


Step 3: Start a New Inspection



Search/Filter the list for any inspections listed "Not Started". To start a new inspection for a particular bridge, click on the corresponding check mark (far right column). This will take you to the New Inspection page.

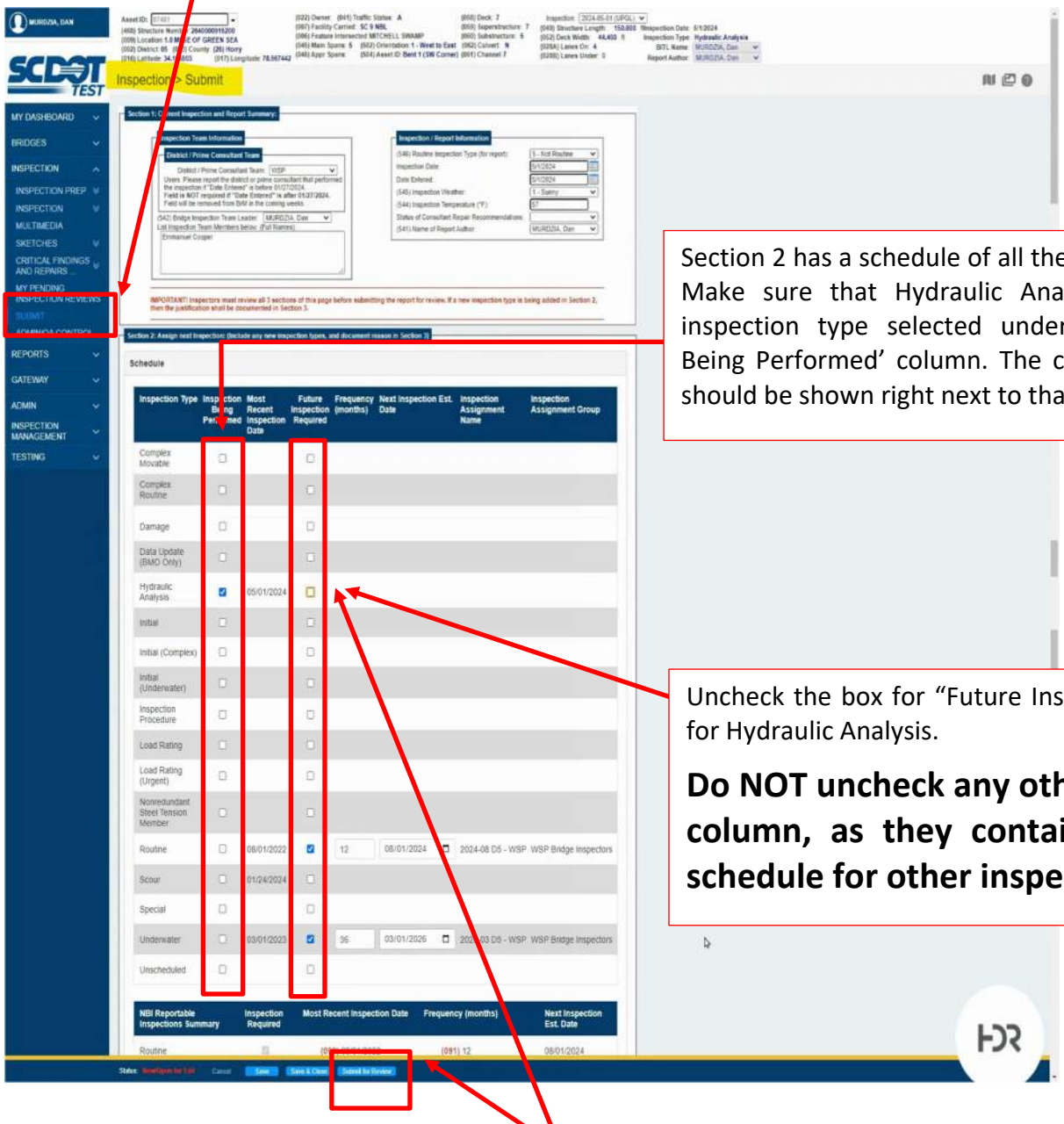
Step 4: Bridges > New Inspection



Click the “Create” button at the bottom of the screen. This will automatically open the inspection page – you will not need to edit or enter any data here.

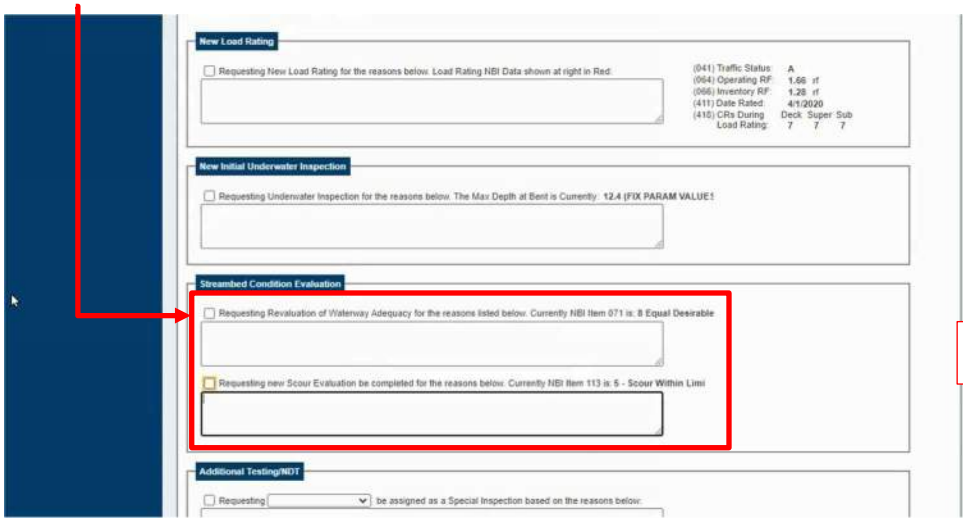
Step 5: Inspection > Submit

Navigate to the Submit Page under the Inspection Tab.



Step 6: Inspection > Submit

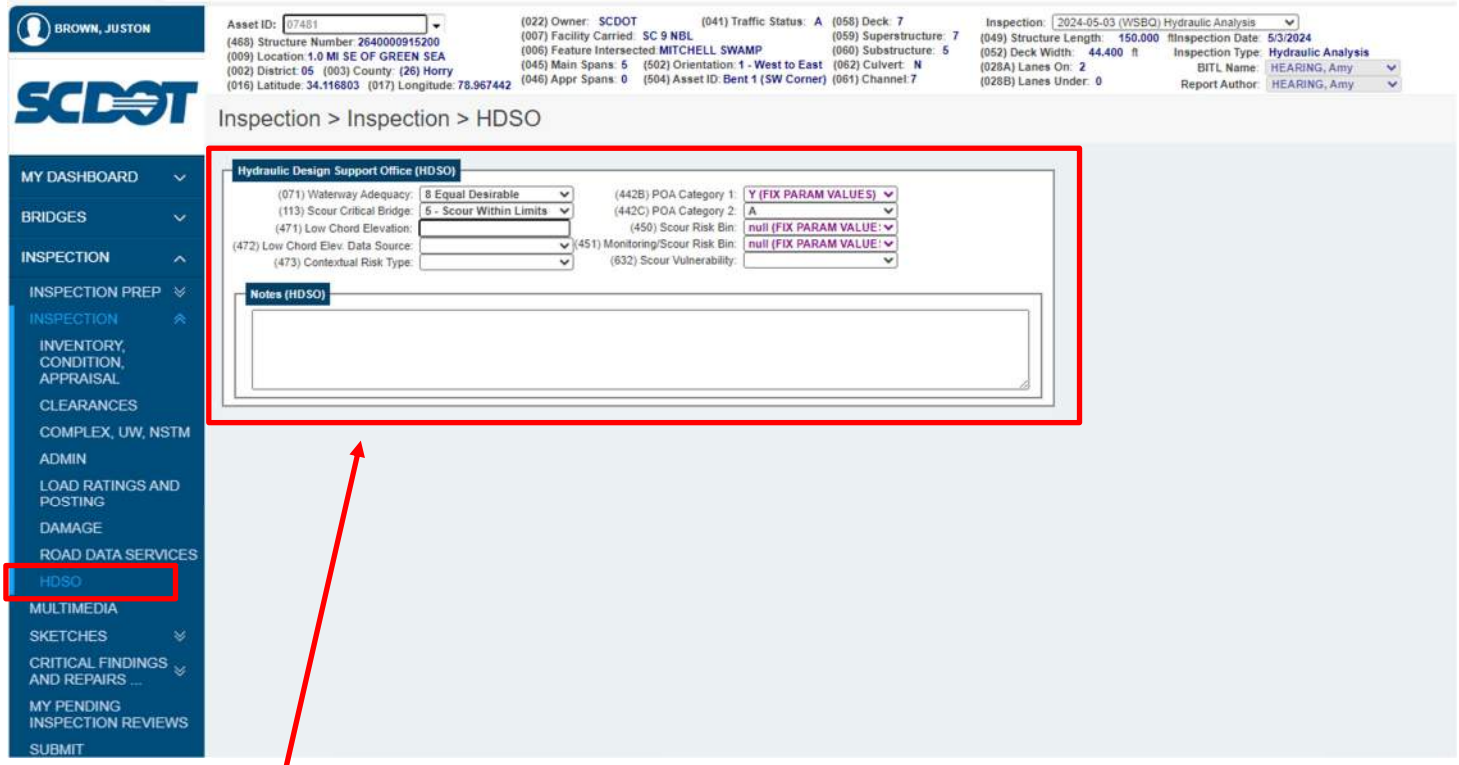
On this same page, scroll down to the **'Streambed Condition Evaluation'** Section and view any reasons why a previous inspection was requested. Uncheck both boxes and clear/delete any text that was written in the boxes underneath (if any). Do NOT edit any other section on this page.



Tip: Don't forget to save your progress!!

Step 7: Inspection > Inspection > HDSO

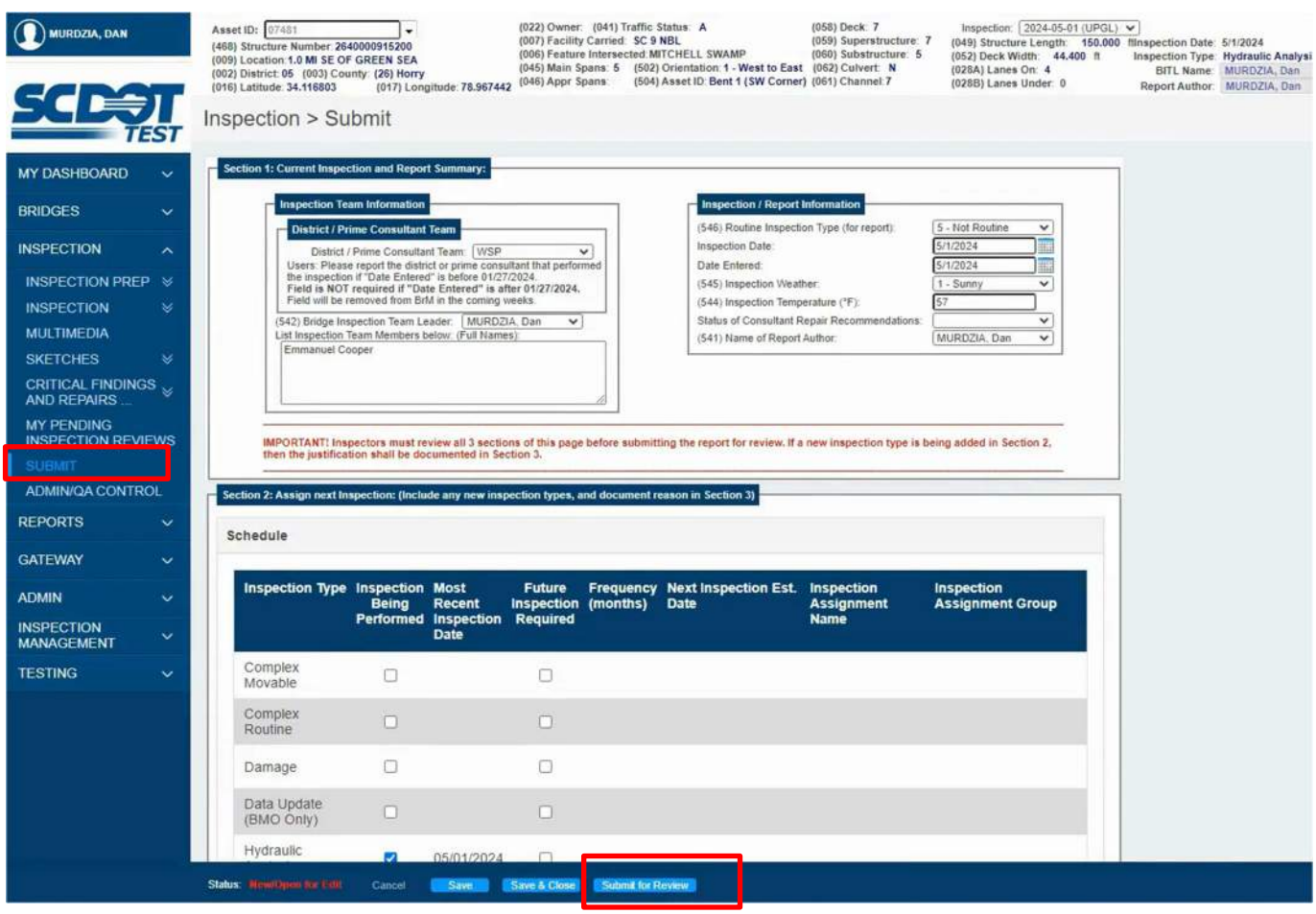
Navigate to the HDSO Page under the Inspection Tab, and 'Inspection' Subtab.



Update the HDSO section and add notes as needed. Save your progress.

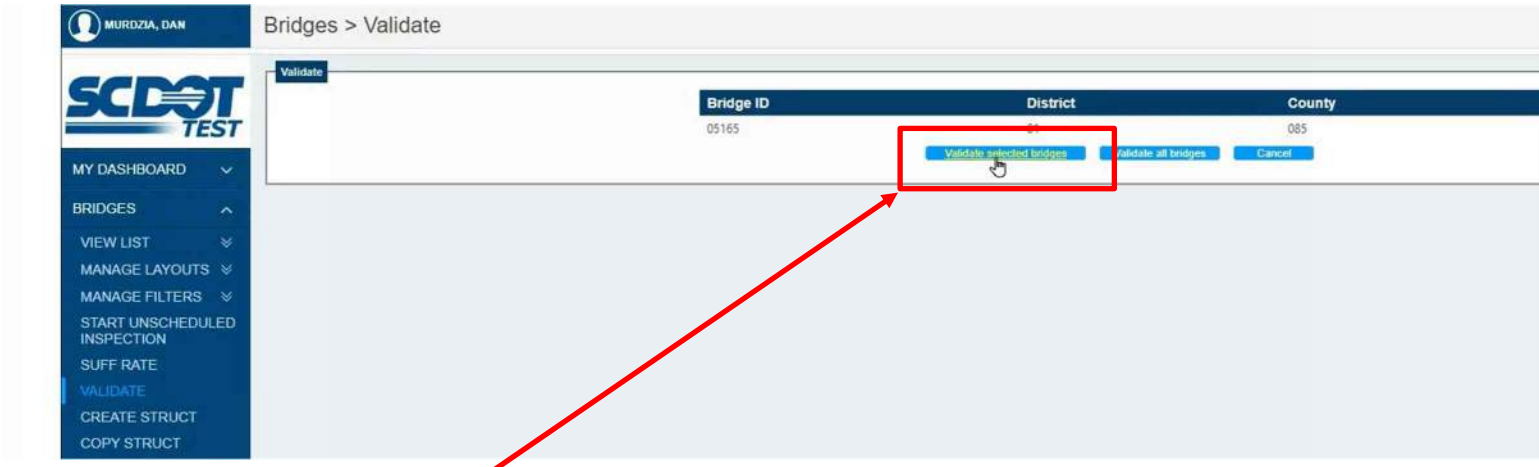
Step 8: Inspection > Submit

Return to the ‘Submit’ page.



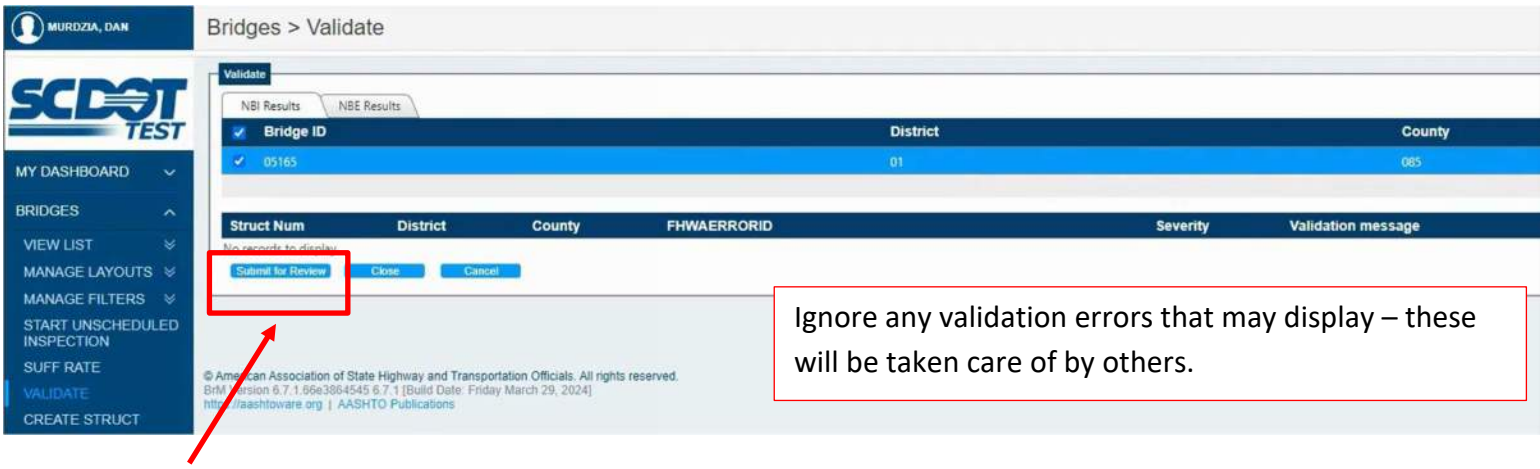
Click ‘Submit for Review’ at the bottom of the screen. This will take you to the Bridge Validation page.

Step 9: Bridge > Validate



Click 'Validate Selected Bridges'.

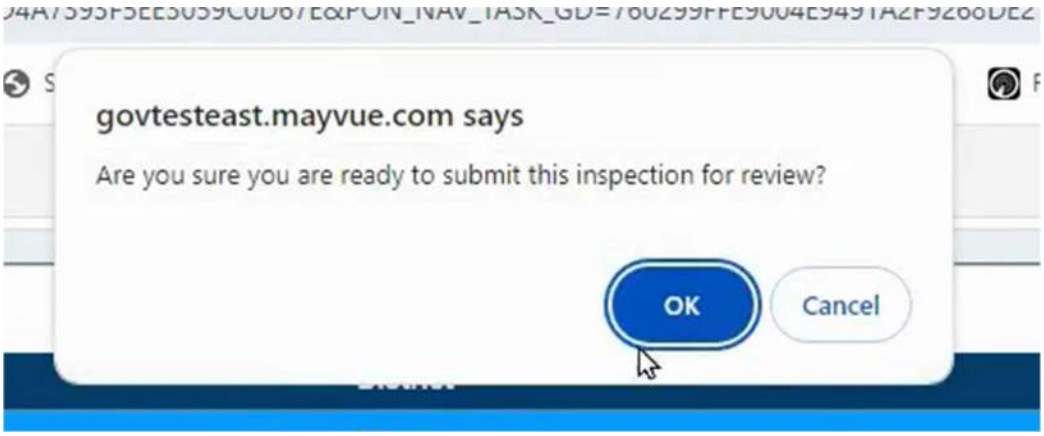
This will take you to the next screen:



Ignore any validation errors that may display – these will be taken care of by others.

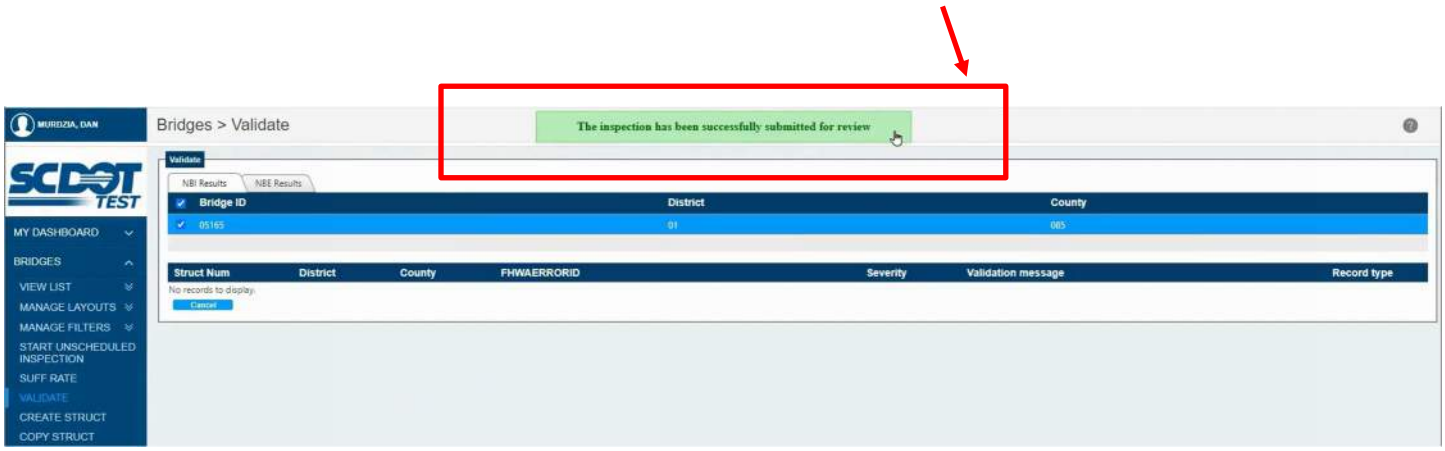
Click 'Submit for Review'.

This will bring up a confirmation box:



Click ‘Ok’

After a few seconds, you should see a green success bar at the top of your screen:



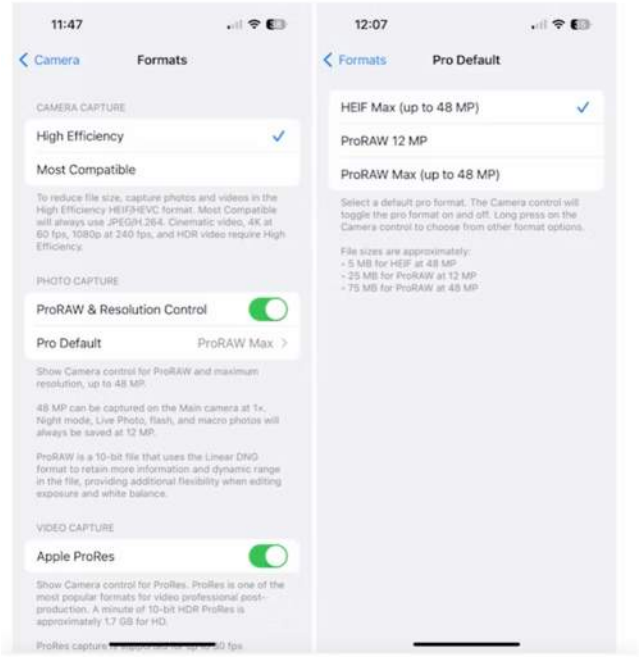
APPENDIX E. CRITICAL FINDING EMAIL PHOTO SIZE

BrM will automatically route the Critical Finding for review and then distribution to FHWA. When a Critical Finding is updated, additional notifications will be sent. BrM will create a PDF summary of the Critical Finding. ***When the PDF is 5MB or less, the PDF will be attached to an email and sent*** – this is preferred. When the PDF is larger than 5MB, the PDF will not be attached, and users will be reminded that the PDF is included in the Multimedia page in BrM.

Users are encouraged to attempt to reduce the size of the photos before uploading them to the Multimedia page in BrM for use in Critical Findings. Photos should be reduced for inspections also so the size of the PDF report is more appropriate. Three options for reducing photo size are included below:

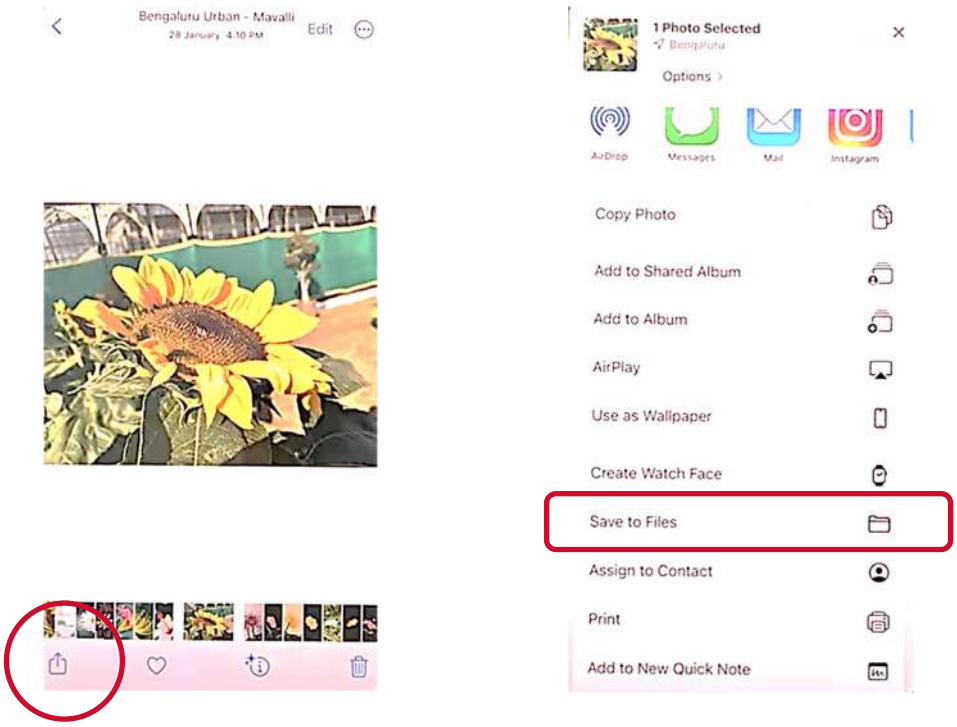
➔ **<u>(Option 1) Adjusting iPhone Camera Settings to Take Reduced Size Photos</u>**

1. Navigate to 'Settings' on your iPhone
2. Tap 'Camera'
3. Tap 'Formats'
4. At the top of the screen, choose 'High Efficiency'. This format will give you the smallest photo size without reducing quality
5. To further reduce the size of your photos, tap 'Pro Default' and choose 'HEIF Max (up to 48MB)'. This will limit your photo size to approximately 5 MB



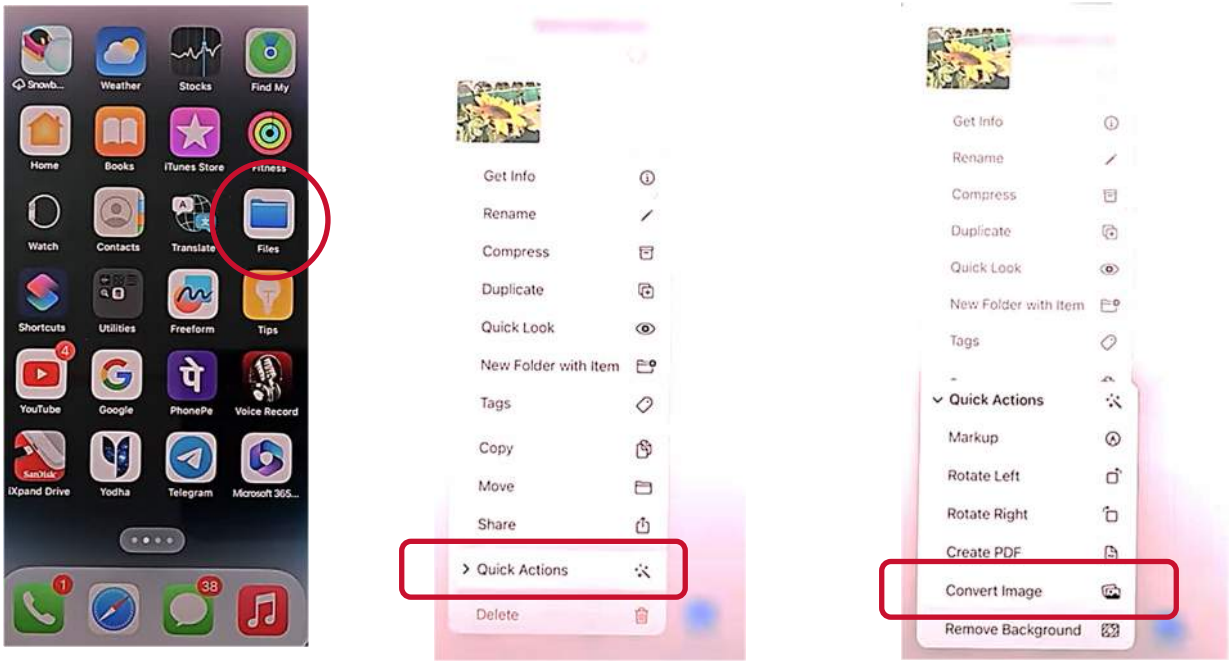
➔ **<u>(Option 2) Reducing Size of Existing Photos Taken on Apple Device</u>**

1. Open the ‘Photos’ app and select the picture you want to compress
2. Tap the ‘Share’ button (bottom left)
3. Scroll down and tap ‘Save to Files’



4. Choose a destination folder and ‘Save’ your photo there

5. Go back to the ‘Home’ screen and open the ‘Files’ app
6. Long-press on your photo and select ‘Quick Actions’ from the pop-up menu
7. Tap ‘Convert Image’

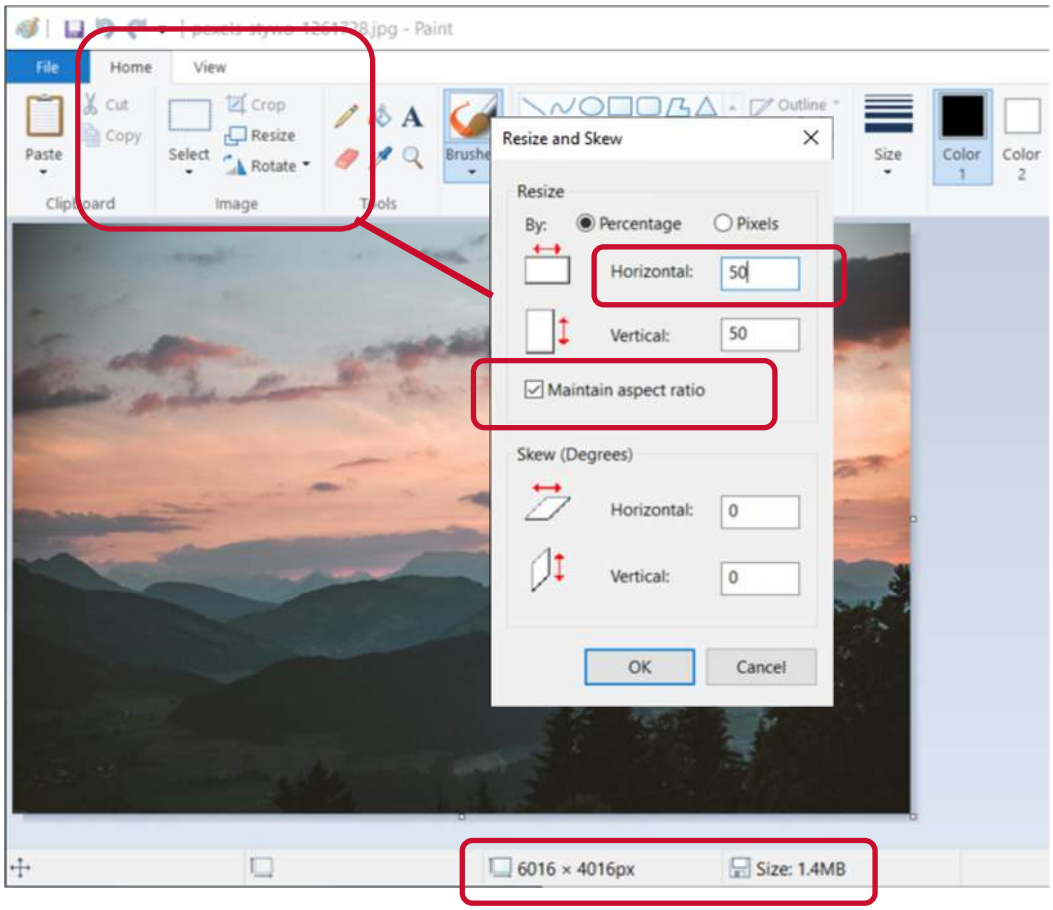


8. Choose a file format (jpeg, png, etc.)
9. Select a desired image size (Small, Medium, Large, or Original)

Your Compressed photo will be saved in ‘Files’ alongside the original image. From there you can share/export as desired.

➔ **(Option 3) Reducing Size of Photos using a Computer (PC) application (Paint)**

1. Open the 'Paint' application [All Programs > Accessories], then open your picture
2. Take note of the original pixel & file size (bottom of screen), and select the 'Resize and Skew' tool located on the 'Home' tab
3. Make sure the 'Maintain aspect ratio' box is checked. Enter the desired width and click 'OK'. The picture will adjust and refresh.



4. Click 'Save As' and rename the image. Your re-sized picture is now ready to upload.

Users may use other applications or methods to try and reduce photo size prior to upload.

APPENDIX F. TIMBER INSPECTION SUPPLEMENTAL GUIDE

The purpose of this appendix is to provide guidance on resistance drill usage on timber bridge elements, including piles, and how to code in-depth timber inspection findings in BrM. Guidance included is for an In-Depth Timber Inspection (IDTI). A similar process can be used for In-Depth Timber Underwater Inspections (IDTUWI).

Step 1: Prepare Equipment and Staff

The BITL is responsible for preparing the required equipment for an In-Depth Timber Inspection according to the Table 2.0 in Appendix T of the BIGD. Hammers and picks are used to sound components. Awls and probes (pointed/flat) are used to examine surface defects. Resistance microdrills (or other drills) are used to examine internal defects.

Resistance microdrills typically come with a user manual or guidance. These manuals should be reviewed. Drill bits on resistance microdrills should be replaced if dull. If you have specific questions about equipment, contact your supervisor. Some equipment may require periodic clearing or recalibration. The BITL is responsible to ensure that the equipment is suitable for use in the field prior to mobilization. Inspectors should keep batteries charged when not in use.

Step 2: Routine Inspection Checklist (for Timber)

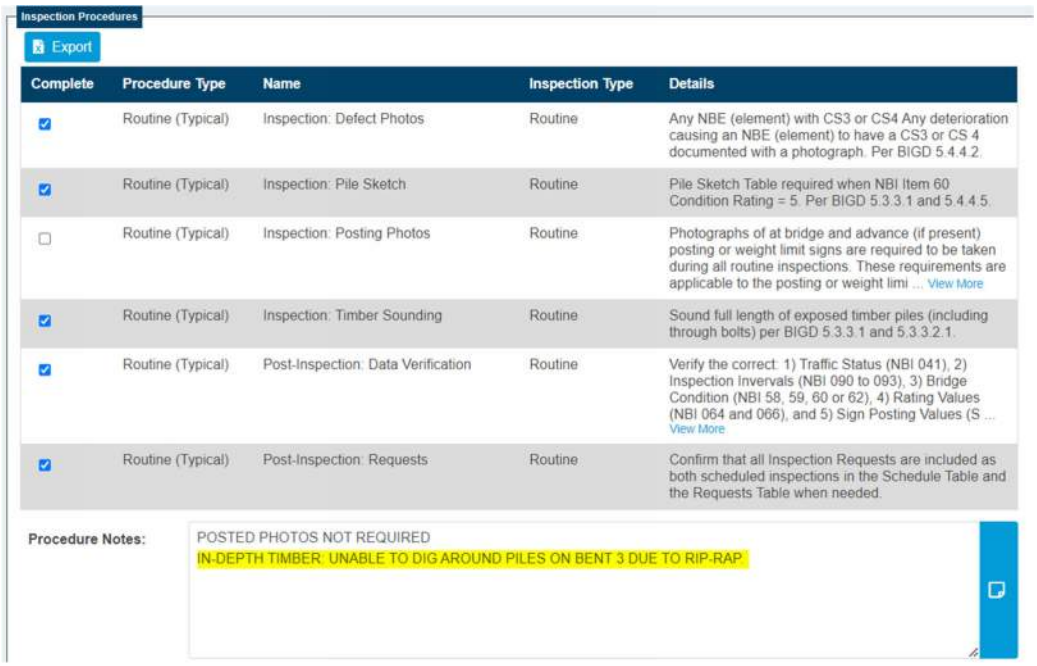
1. Visually Inspect Timber Members (bent caps, piles, bracing, etc.)
2. Sound Full Length of Timber Piles
3. Probe Timber Piles for Surface Defects
4. Include Defects in Inspection Report
5. Confirm Schedule Accuracy for Interval and Next Date for In-Depth Timber Inspections

Step 3: In-Depth Inspection Field Checklist

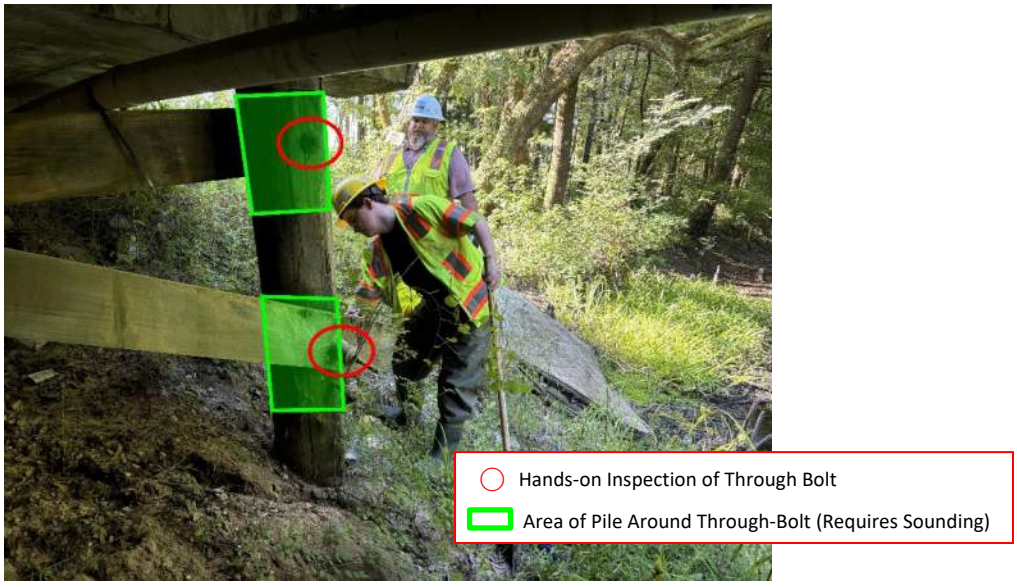
1. Visually Inspect Timber Members (bent caps, piles, bracing, etc.)
2. Sound Full Length of Timber Piles
3. Probe Timber Piles for Surface Defects
4. Dig around the base of timber piles on land for a minimum of 12” to examine for hidden defect(s)

   A shovel may be used to remove sediment or soil around the base of timber piles. A machete may be used to remove vegetation. If boulders or large rip-rap are in place around the base of timber piles, digging is not required. For any piles where the digging is not completed, it shall be noted on the Inspection Prep > Logistics Page as to why that inspection procedure was not followed.

**** TIP: If you are performing an In-Depth Timber Inspection on a bridge and the inspection was not scheduled, the inspection procedures may not automatically load. During the next In-Depth Timber Inspection, the procedures will appear. ****



5. Sound each through bolt and perform a hands-on inspection of the bolt (if any),
6. Sound the timber around each bolt (above, below and on each side of the bolt on each face of the pile) and,



7. Measure controlling (largest) unbraced length on timber piles and check against Section 8.3 and Tables 8.3.1 and 8.3.2 in Appendix T of the BIGD which includes unbraced pile height recommendations.
8. Cross-bracing should be visually inspected and sounded decay is suspected. Drilling or advance techniques are not required on the cross-bracing. Defects for cross-bracing are to be included under Element #879.

9. If the controlling defect on the pile is decay (Defect 1140), resistance drill one (1) location on one timber pile on each bent for timber piles listed as CS3 or CS4. If results are unexpected, drilling may be warranted on a maximum of one (1) additional pile in that bent.

Resistance Drilling

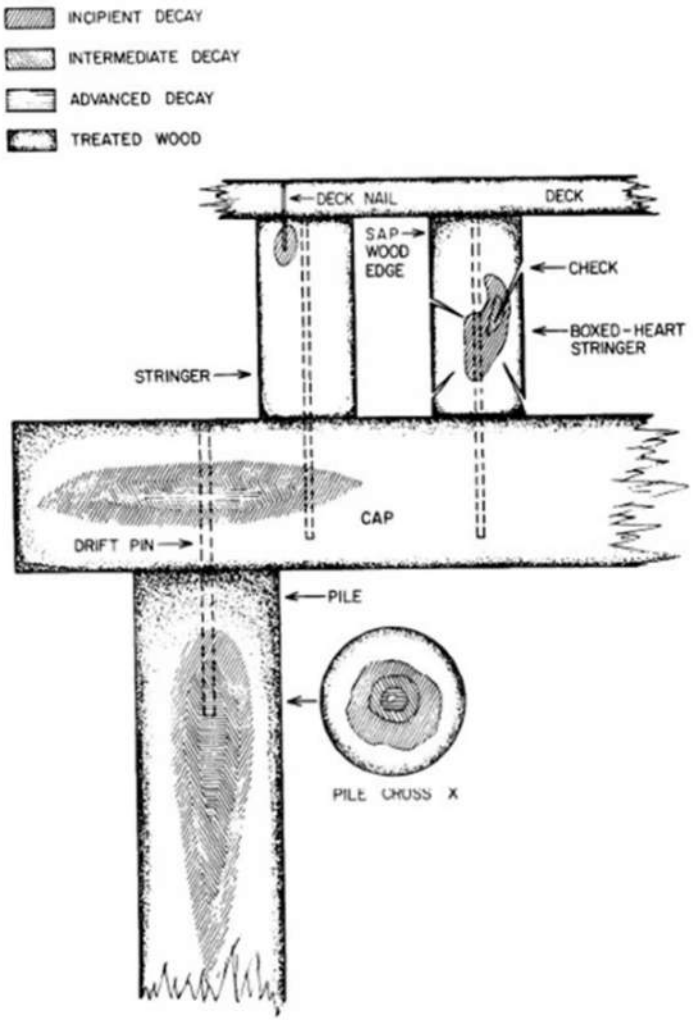
The section below is only guidance, the BITL is responsible for determining the timber elements to be drilled and how/where to drill.

Selection a Location to Drill

1. Only timber bents with at least one pile in CS3 or CS4 for decay Defect 1140 require drilling. If the bent does not have any piles in CS3 or CS4 for decay Defect 1140, no drilling is required.
2. If only one timber pile is in CS3 or CS4 on that bent, that pile shall be drilled on that bent.
3. If multiple piles are in CS3 or CS4, a minimum of one pile shall be drilled. Other piles may be drilled if approved by the DBIS. To select a pile to drill, follow these steps:

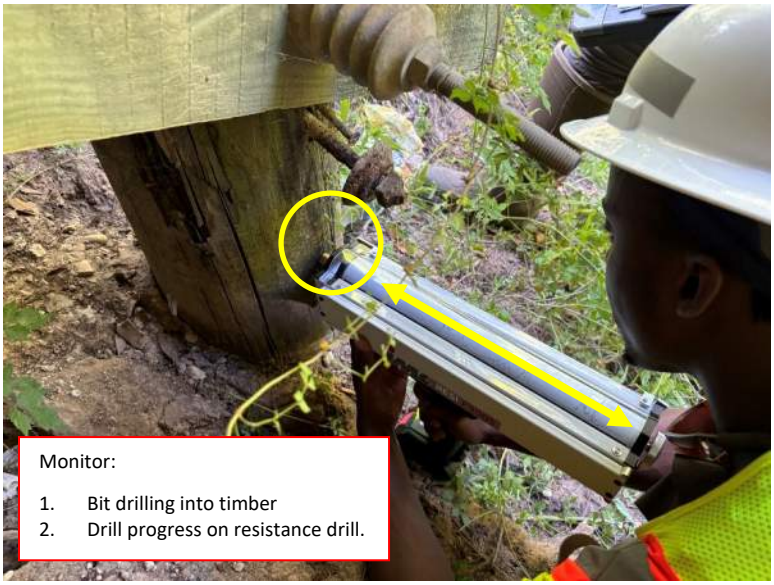
1) Drill a pile in CS4 over a pile in CS3.
2) Drill an interior pile or a pile closer to the main load path versus an exterior pile in the same Condition State.
3) If the pile has previously been drilled with minimal defects, the pile should not be drilled again if other piles are in a similar Condition State.

4. To determine the location on the pile where to drill, consider the following.
    1) Goal is to determine the location to obtain the controlling or minimum timber cross section area remaining as it will control condition coding and load rating.
    2) Drill the pile at a location of a known defect (sounding, 1” or wider checks, visible decay (mushroom), etc.)
    3) Drill the pile at a location of a suspect defect (adjacent to nails or timber penetrations, cuttings, etc.)
    4) See the diagram below showing likely areas to find decay. **Caution should be taken to avoid drift pins, through bolts and other hardware when drilling.**



Drilling and Field Documentation

1. Insert chart/printout into the drill (if paper slips are used).
2. If drilling at-height or in-water, use a strap (if provided) to avoid fall hazard and to avoid damage or loss of drill.
3. Unless using an angled adapter, hold the microdrill level and perpendicular to the timber element.
4. Confirm the drill is in the forward drill position.
5. Drill, maintaining constant speed, level, and straight direction orientation.
6. Observe the drilling progress by monitoring both the bit and looking at the drill progress on the recording screen or the chart/printout of the drill result (if paper slips are used).



7. Once drilling has been completed, switch the drill into the backward drill position.
8. Drill backwards.
9. Wait until the drill has been completely removed from the timber element and lower the drill.
10. Mark the drillhole and indicate the date drilled (MM/DD/YY) and the identification number of the timber element (i.e. P3-2) next to the drillhole on the timber element using chalk, paint tip marker, or other tool.

**** TIP: If the same pile is drilled multiple times on the same date, indicate each drilling by using an alphabetic order with the first drilling identified as "001", "002", etc. ****

11. Add the date drilled and the identification number of the timber element on chart/printout of the drill result (if paper slips are used).
12. Fill the drillhole with silicone sealant or marine adhesive.

13. Take a photograph of the following each drilling:
    1) Timber member drilled (general photo with drill hole visible)
    2) Close up photo of drill hole (with marked hole, the date, and the identification number of the timber element visible)
    3) Chart/printout of the drill result (if paper slips are used)

Step 4: In-Depth Inspection BrM Documentation Checklist

1. Initiate subject inspection event (Routine, Special, Underwater, Unscheduled, etc.) where the In-Depth Timber Inspection is being performed in conjunction with. If the bridge already has an assigned In-Depth Timber Inspection, initiate that inspection event.

**** TIP: It is anticipated that some In-Depth Timber Inspections that bridges will receive will be performed in conjunction with another inspection type. Inspectors are cautioned to review inspection pages when multiple inspections are performed at the same time. See note on previous page about Inspection Procedures not appearing with In-Depth Timber Inspections that are initiated from the Start Inspection screen. ****

2. Update the Inspection > Sketches > Piles Page.
    1) See following page for a full example of a complete page.
    2) The Piles Page shall be used if the Substructure Condition is Fair (5) or worse or if an In-Depth Timber Inspection was performed on the bridge.
    3) Complete the fields on the Piles Page for the piles inspected. Note that not every pile needs a row, however, any pile that has been drilled must be included.
    4) If a pile was drilled, the pile percent remaining shall be obtained per Section 8.2 of Appendix T of the BIGD.

$$Percent\ Decay = \frac{Length\ of\ Measured\ Decay}{Diameter\ of\ Decayed\ Pile} \times 100\%$$

    5) If a pile was drilled, the location of pile percent remaining shall be indicated. Since the **Notes** field has a specific location, the "Other" choice in the location dropdown can be used as needed.
    6) Pile Size / Thickness – this shall be entered are the **REMAINING CROSS SECTION AREA** of the pile (in square inches) and not the diameter or size of the steel shape. Full areas are below for piles without section loss. Calculate remaining cross section for piles with decay.

ROUND PILES									
Diameter	6"	7"	8"	9"	10"	11"	12"	13"	14"
Area (in^2)	28	38	50	64	79	95	113	133	154

STEEL H-PILES						
Pile Size	HP10x42	HP10x57	HP12x53	HP12x63	HP12x74	HP12x84
Area (in^2)	12	16	15	18	21	24

    7) Pile Inclination shall measure the angle of the pile while considering a true vertical pile at 90 degrees.

8) The **Notes** field shall be updated using the standard text below for piles that are drilled. Please copy and paste this text into each **Notes** field for piles that are drilled. **This text is only required for piles that have been drilled.**

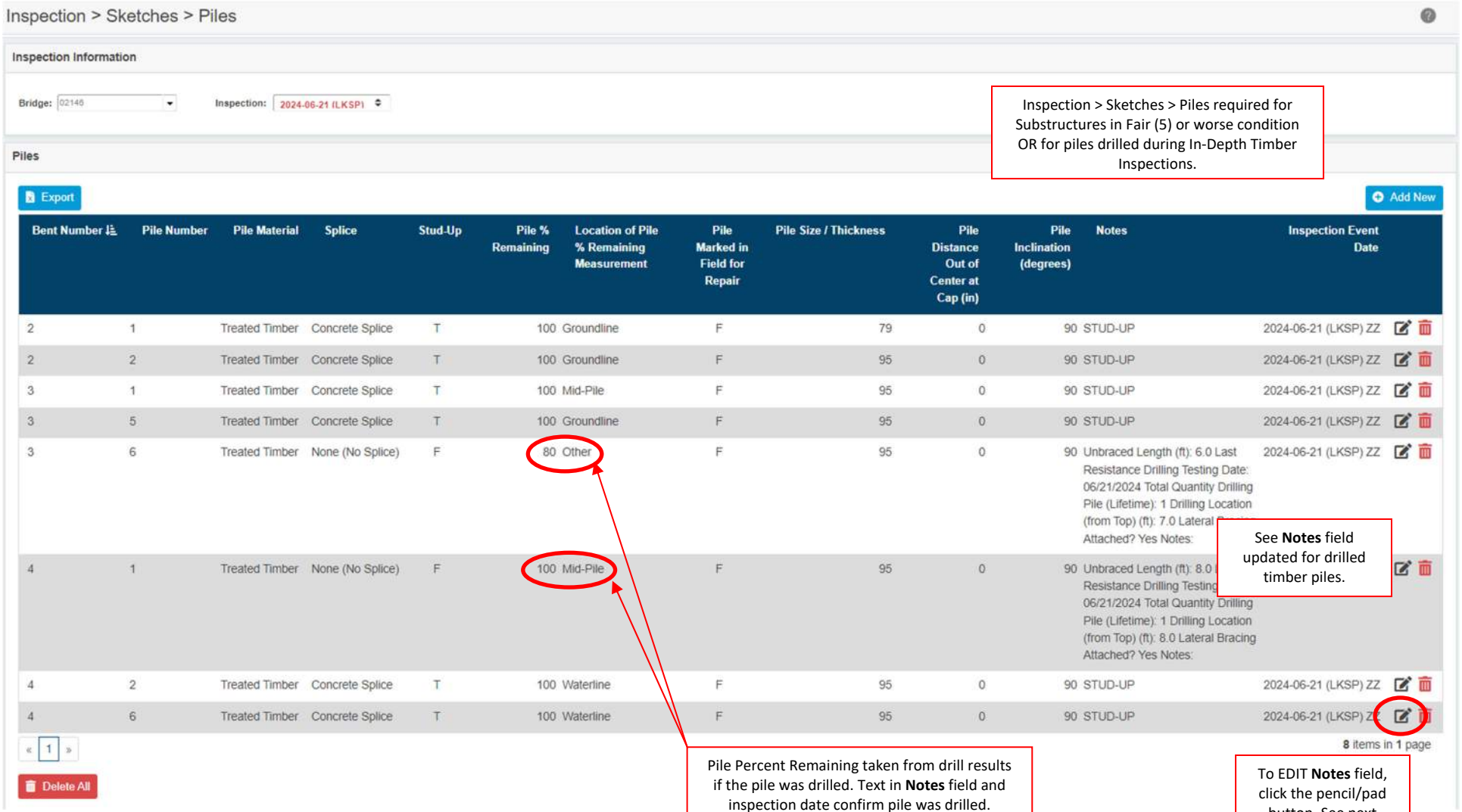
Unbraced Length (ft): #.#
Last Resistance Drilling Testing Date: MM/DD/YYYY
Total Quantity Drilling Pile (Lifetime): #
Drilling Location (from Top) (ft): #.#
Cross-Bracing Attached? Yes/No
Notes:

- Unbraced Length is the maximum length of unbraced pile in feet measured to tenth decimal point. Typically, from cap to bracing or bracing to groundline. A specific pile may have a condition where the cap/drift pin or bracing is not providing pile bracing.
- Last Resistance Drilling Testing Date is the date the pile was drilled during the inspection.
- Totally Quantity Drilling Pile (Lifetime) is the total number of known times that the pile has been drilled in its lifetime.
- Drilling Location (from Top) is measurement from the top of the pile to the drilling location in feet measured to tenth decimal point.
- Cross-Bracing Attached is a Yes/No field to indicate if there is or is not cross-bracing attached to the file.
- Any additional notes can be placed at the bottom of the text.

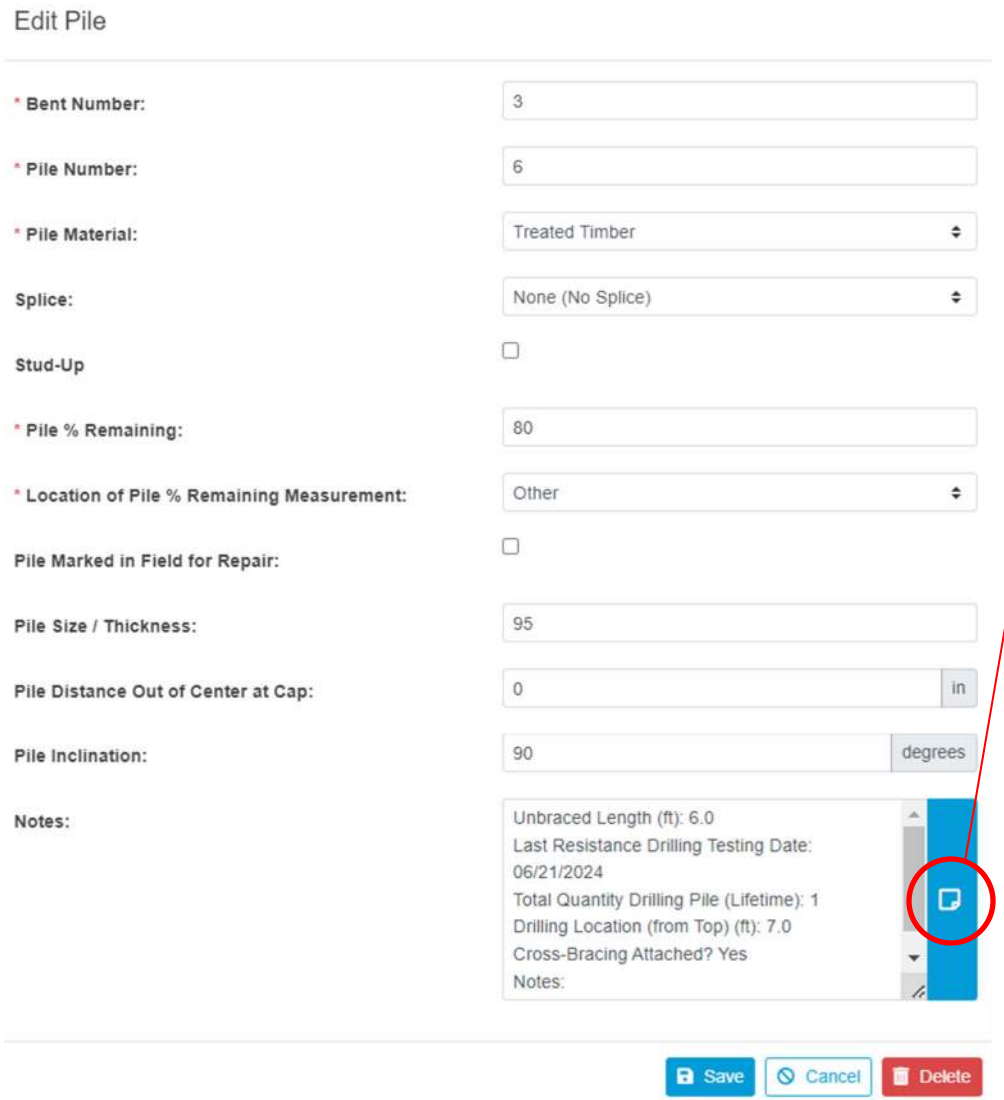
***** WARNING *****

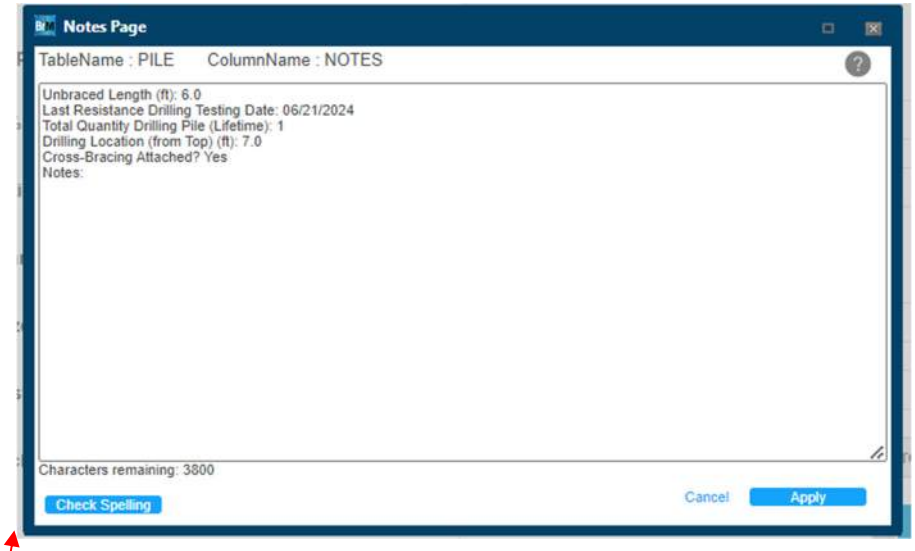
To allow the data to be searchable in the database, DO NOT remove the headings to the left side of each row. Keep the text there and replace the text after the colon or question mark in each line. If the heading is removed, the data will not be populated when we switch to the SNBI data in future version of BrM. For example, your text should read "Unbraced Length (ft): 3.5" for the first line.

Example Pile Page (Page 1 of 2)



Example Pile Page (Page 2 of 2)





Click Notepad to Expand Notes field and add your text there.

**** TIP: Use Keyboard Shortcuts ****

Copy: Ctrl + C

Paste: Ctrl + V

Undo: Ctrl + Z

3. Update the Element Table on the Inventory, Condition and Appraisal Page

   A list below includes the elements added as part of the release of Appendix T of the BIGD. If you are adding any of these new timber pile elements, you need to lower the quantity and Condition States of Element 228 (Timber Pile) accordingly.

**** TIP: When needing to lower the total quantity, the auto calculated CS1 total will not update on its own. Click and enter a value in another condition state total, when you press enter, the CS1 total will correct. ****

No.	Element and Description	Example Photograph
879	**Timber Pile Bent Cross-Bracing #879** Linear footage of each element of cross-bracing present on a timber pile bent.	
870	**Existing Timber Pile under Crutch** Timber piles which are in-place but there is a crutch beam or crutch bent which is supporting the majority of the superstructure load.	
872	**Stubbed or Spliced Timber Pile** A portion of the timber pile is encased in a concrete stub or is spliced (more common historic repair).	

874	**Wrapped Timber Pile** A portion of the timber pile is wrapped in a material to prevent further deterioration (non-structural).	
876	**Structurally Repaired Reinforced Pile (Rebar)** A pile structurally rehabilitated and the repair has reinforcing steel. The repair can be wrapped in an exterior fiberglass or plastic jacket (includes common jacket repairs).	
877	**Structurally Repaired Reinforced Pile (FRP)** A pile structurally rehabilitated with fiber reinforced polymer	
878	**Structurally Repaired Reinforced Pile (Other)** A pile structurally rehabilitated with other materials (not reinforcing steel and not FRP).	

The checkmark at the left side of the Element Condition table indicates what elements are inspected during the subject inspection and which ones are not. The checkmarks shall be used for all inspections including In-Depth Timber Inspections. If In-Depth Timber Inspections are performed in conjunction with other inspections, all checkboxes may be selected.

Example Element Table

Element Conditions

Hide Elem Inspection Details | Arrow Key Grid Navigation Help

Element: Elem # or Elem Desc | Struct. Unit:: All | Env.: All | Clear Filters | Quantity / Percent | Add Element

Elem.	Str. Unit.	Env.	Element Description	Tot. Qty.	Units	Qty1	Qty2	Qty3	Qty4
38	1	Low (2)	Re Concrete Slab	2030	sq.ft	1,480.000	550	0	0
1120	1		Efflorescence/Rust Staining	100	sq.ft	0.000	100	0	0
1130	1		Cracking (RC and Other)	400	sq.ft	0.000	400	0	0
1190	1		Abrasion(PSC/RC)	50	sq.ft	0.000	50	0	0
215	1	Ben. (1)	Re Conc Abutment	58	ft	58.000	0	0	0
228	1	Ben. (1)	Timber Pile	30	each	27.000	2	1	0
1140	1		Decay/Section Loss	1	each	0.000	0	1	0
1170	1		Split/Delamination (Timber)	2	each	0.000	2	0	0
234	1	Low (2)	Re Conc Pier Cap	116	ft	114.000	2	0	0
1080	1		Delamination/Spall/Patched Area	1	ft	0.000	1	0	0
1090	1		Exposed Rebar	1	ft	0.000	1	0	0
301	1	Mod. (3)	Pourable Joint Seal	116	ft	116.000	0	0	0
310	1	Low (2)	Elastomeric Bearing	6	each	6.000	0	0	0
872	1	Ben. (1)	Stubbed or Spliced Timber Pile	6	each	0.000	6	0	0
1140	1		Decay/Section Loss	6	each	0.000	6	0	0
879	1	Ben. (1)	Timber Pile Bent Cross-Bracing	116	ft	116.000	0	0	0

4. Make Repair Recommendations

See Appendix O of the BIGD for guidance on repair recommendations for elements inspected during In-Depth Timber Inspections.

If bracing is missing, a Priority B “B Flag” shall be submitted by the BITL. The member should be recommended for replacement if in CS4 (Element #879). See Section 8.3 and Tables 8.3.1 and 8.3.2 in Appendix T of the BIGD for additional guidance on bracing including unbraced pile height recommendations. If the unbraced pile height is 10’ or more or 8’ with a wearing surface, the tables should be checked to confirm the unbraced pile height recommendations.

5. Add Multimedia of Drill Logs to the Bridge File

   The drill log shall be placed in Folder “6 – Testing” of the Bridge File (ProjectWise). Photographs of the timber element and the drill hole do not need to be uploaded to the Bridge File (ProjectWise). The file that gets uploaded to the Bridge File can be a .pdf or image file.

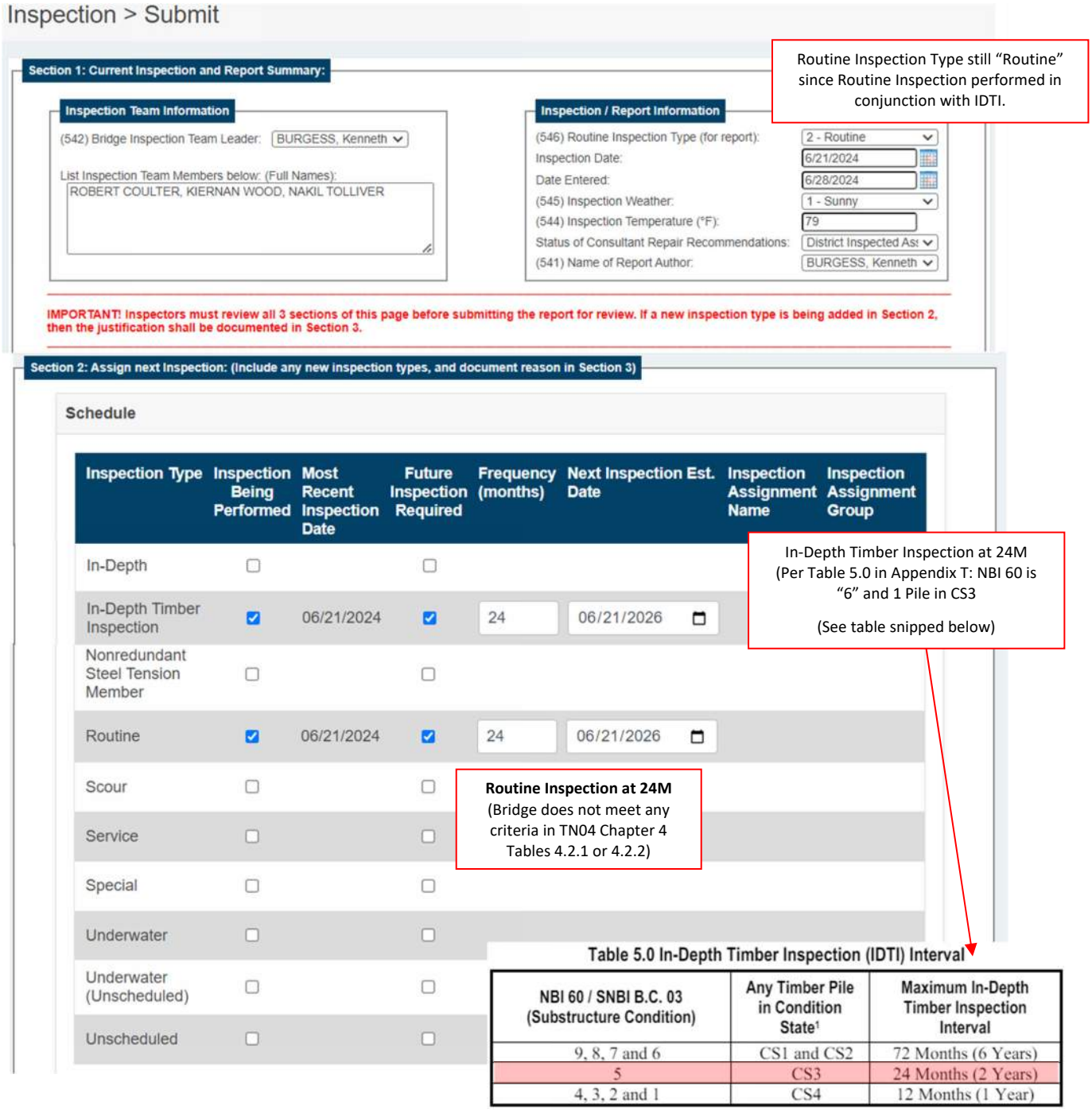
   FREEFORM = Member Being Drilled (i.e. P#-# for piles)
   YYYY-MM-DD = Date of Drilling
   ### = Bridge File Serial Number. Should be 001 if only drilling the pile once on the same day. May need to increase serial number if drilling the same pile more than once on the same day.

6. Confirm Inspection Procedures for In-Depth Timber Inspection Completed

   Confirm all inspection procedures for In-Depth Timber Inspections are completed on the Inspection Prep > Logistics Page.

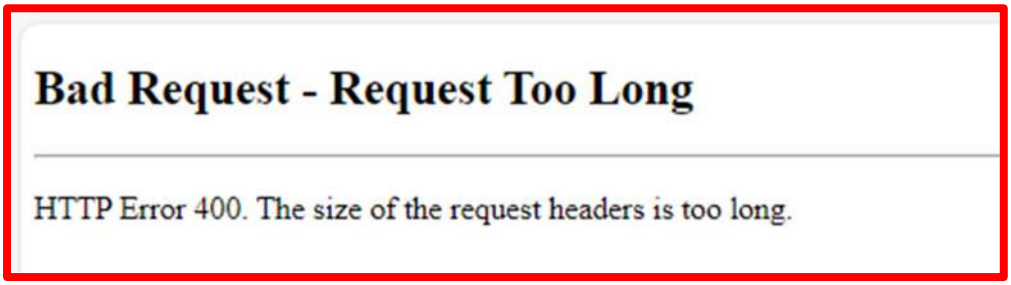
7. Review Schedule on Submit Page

When you complete your inspection, make sure the correct inspection types are still scheduled on the Schedule Table on the Submit Page. Future In-Depth Timber Inspections shall be scheduled in conformance with Appendix T of the BIGD.



APPENDIX G. BRM TROUOUBLESHOOTING TIPS

1. **HTTP Error 400**



This error is due to identity provider (Microsoft) authorization token expiring. Resolution is to clear your cache.

When this occurs, you can navigate to https://govprodeast.mayvue.com/SCDOT/saml2/logout to clear out the expired token to force a refresh of token. It actually does not log out as the saml2 is not configured to log out due to Windows workflow tips.

APPENDIX H. SNBI COLLECTOR

SCDOT has deployed an interim, progressive web application, the SNBI Collector, which enables inspectors to collect targeted SNBI data in the field on any device and can review and validate the data via their desktop computers. SCDOT has selected bridge-level data below that will be collected in the SNBI Collector. A flowchart has been developed to assist with the coding of B.RH.01 and B.RH.02. The Specifications for the National Bridge Inventory (SNBI), including any updates/errata, shall be used to code these fields. Data in the SNBI Collector will be ported to BrM at a later date.

- B.RH.01 - Bridge Railings (Bridge Level) - (See Flowchart)
- B.RH.02 - Transitions (Bridge Level) - (See Flowchart)
- B.SB.01 - Substructure Configuration Designation
- B.SB.02 - Number of Substructure Units
- B.SB.03 - Substructure Material
- B.SB.04 - Substructure Type
- B.SB.05 - Substructure Protective System
- B.SB.06 - Foundation Type
- B.SB.07 - Foundation Protective System

SCDOT SNBI Collector Access Link:

SNBI Collector (SCDOT)

***** WARNING *****

The SNBI Collector is not linked to BrM. The SNBI Collector shall only be used to collect data on bridges in your district. The SNBI Collector shall only be used to collect the data listed above. Data fields deleted, edited, or added to the SNBI Collector that are not linked to the fields above will be lost when converted into a future instance of BrM.

The SNBI Collector will work in your browser on your computer, laptop, tablet, or mobile device. There is also a SNBI Collector Application in the Apple Store. The SNBI Collector will automatically check for update. The SNBI Collector will work online and offline.

Figure H.1 Apple Store Screenshot of SNBI Collector App

SNBI Collector Typical Workflow

1. Go to Download Page
2. Download a Bridge
3. Edit from Bridge List Page
4. Validate Bridge Data using Bridge List Page or Validation Page
5. Upload Bridge Back to the Server from Upload Page

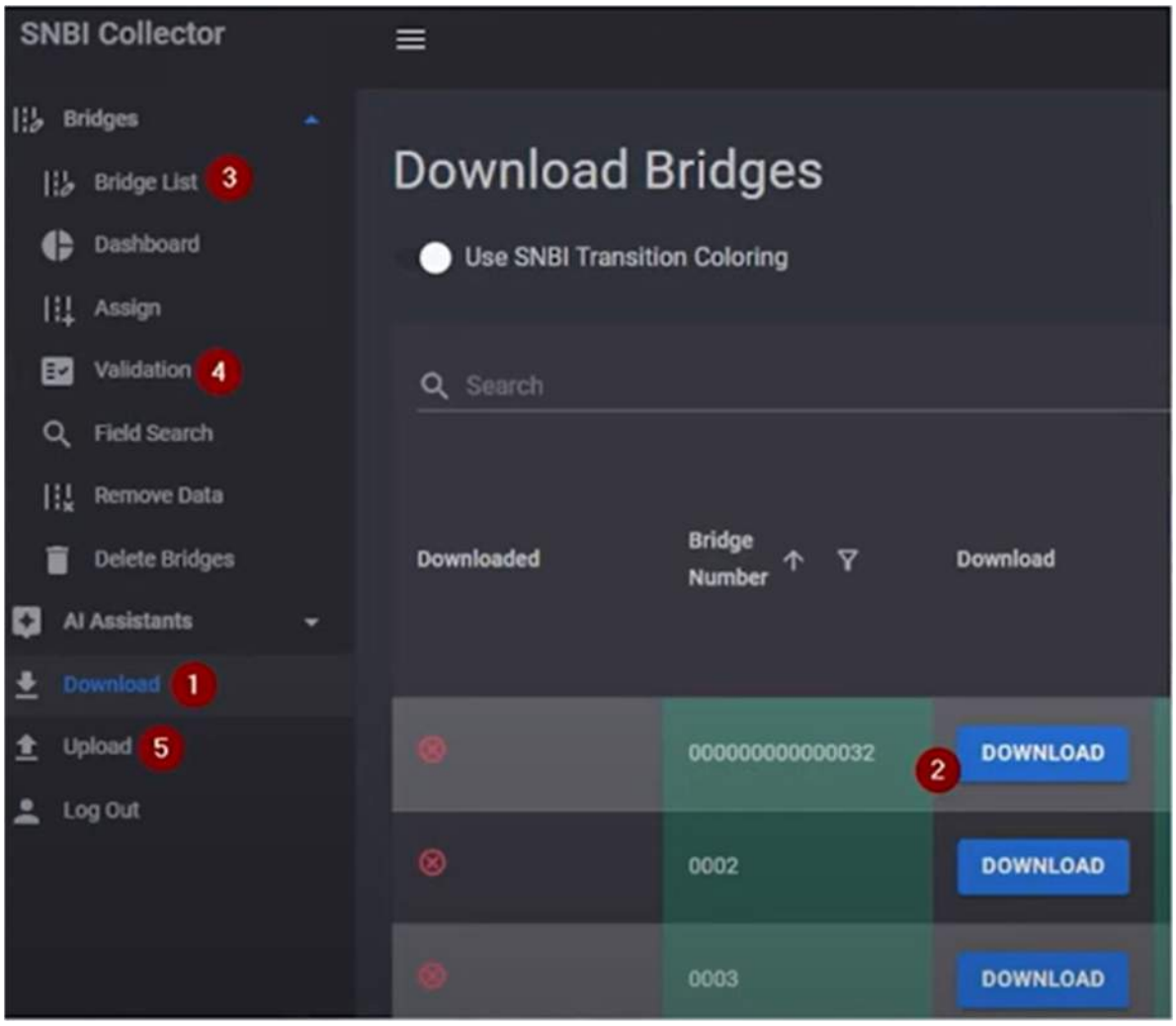


Figure H.2 SNBI Collector Typical Workflow Screenshot

This workflow is explained on the following pages, in more detail and with additional detailed steps to provide clarity.

Step 1: Accessing SNBI Collector

Figure H.3 Accessing SNBI Collector

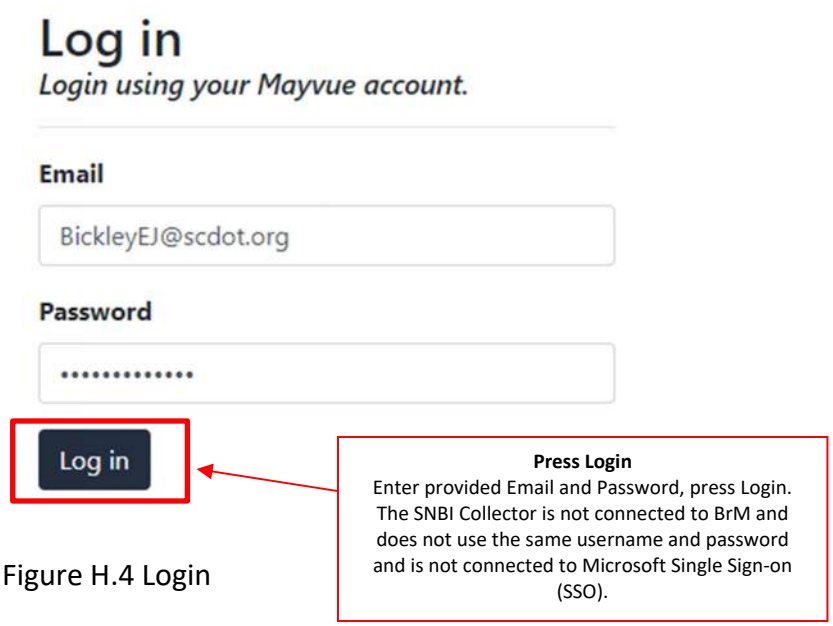


Figure H.4 Login

Step 2: Download Bridge(s)

When you first open the SNBI Collector, you may see a screen where it says “No Bridges Downloaded, Go to Download Page”. Users can only view and edit the bridges they have access to. To download a bridge to your device, click “Download”.

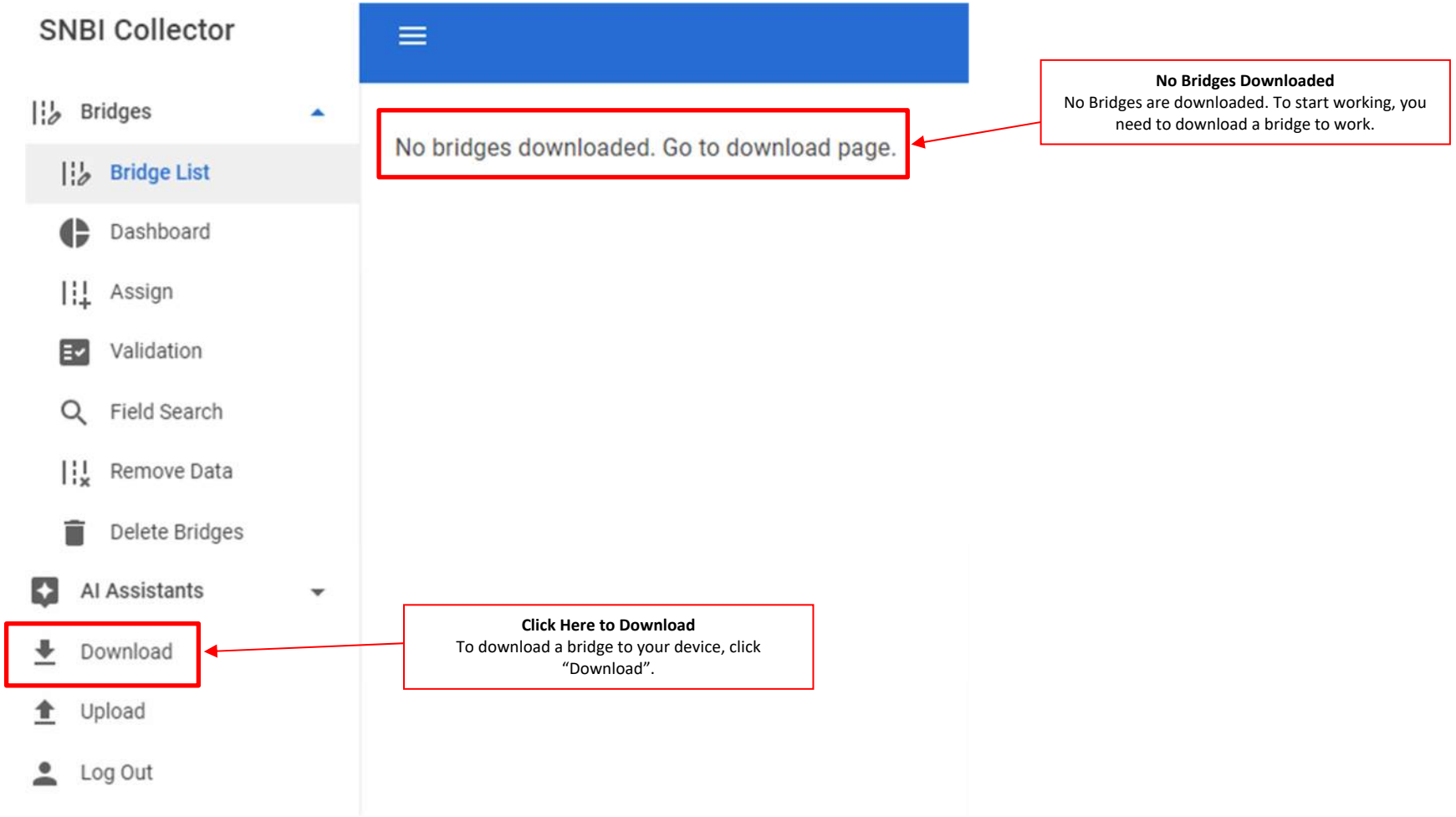


Figure H.5 Bridge List with No Bridges Downloaded

Step 2: Download Bridge(s) (continued)

Search for a bridge to download it. When you search, you will see the Red Mark (⊗) indicating the bridge is not currently downloaded. To download, press the download button to download the bridge to your device. Once you download a bridge, you can return to Bridge List and edit data.

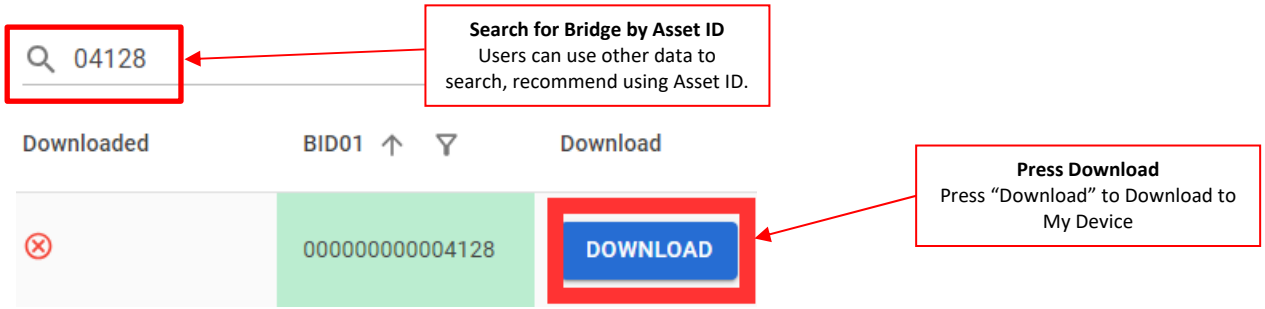


Figure H.6 Downloading Bridge (Example 04128) to Device

On the Download Screen, bridges with a Green Checkmark (✔) are downloaded to your user's device. Bridges with a Red Mark (⊗) are available for your user to download.

Figure H.7 List of Bridges (Not Downloaded)

Step 3: Understanding the SNBI Collector View

Two options are available to help you view data:

- Use SNBI Transition Coloring (Green, Yellow, Red)
    - Red = Field has not been transferred from the Recording and Coding Guide Data to SNBI, edit required
    - Yellow = Field has been partially transferred from the Recording and Coding Guide Data to SNBI, review/edit required
    - Green = Field has been fully transferred from the Recording and Coding Guide Data to SNBI, review and edit, if needed
    - When you are done updating data, your data cells should appear Green since they are SNBI Compliant. Also, your fields will have a border around them, similar to BrM that shows the data is not saved and needs to by synced to the cloud. The full SNBI Collector Legend is included at the end of this Appendix.
- Use Names as Headers toggles the SNBI Field Numbers versus Names (i.e. B.L.10 versus Bridge Location). The opposite option appears in the Tool Tip.

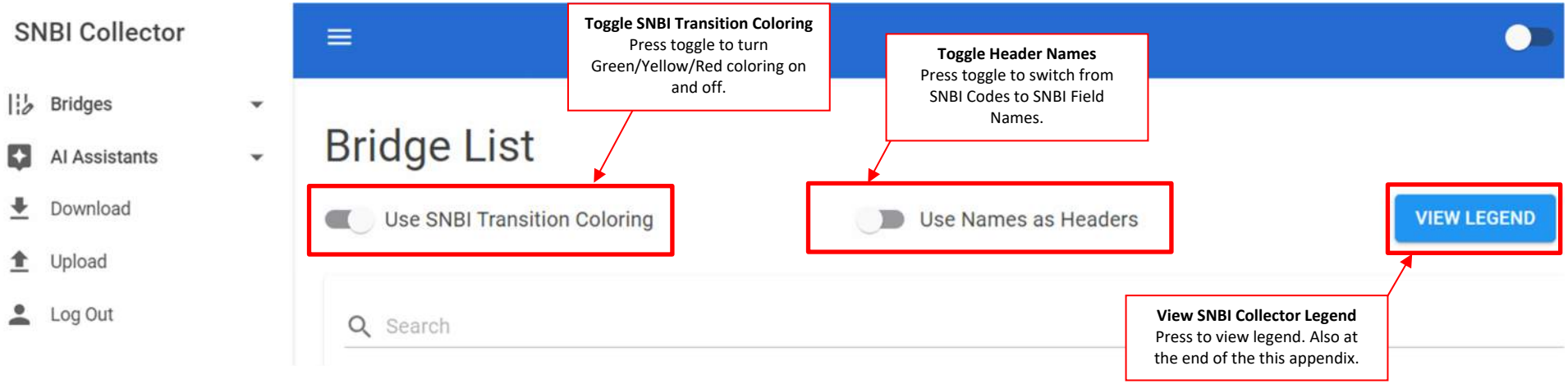


Figure H.8 SNBI Collector Configuration Options

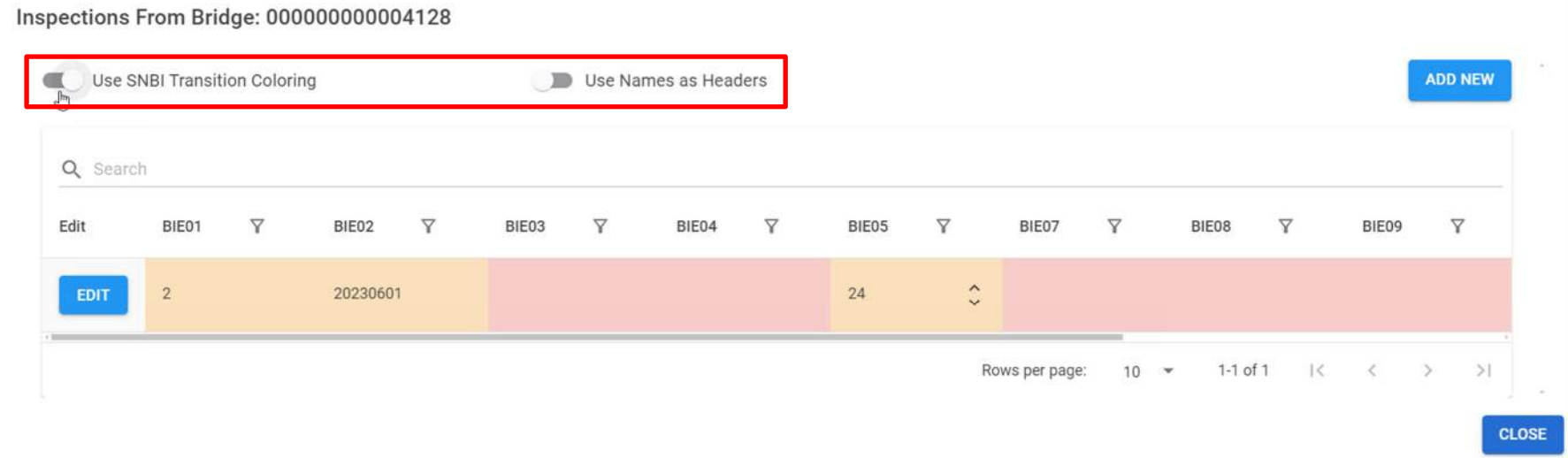


Figure H.9 SNBI Collector Configuration Options (SNBI Transition Coloring On, Use Names as Headers Off)

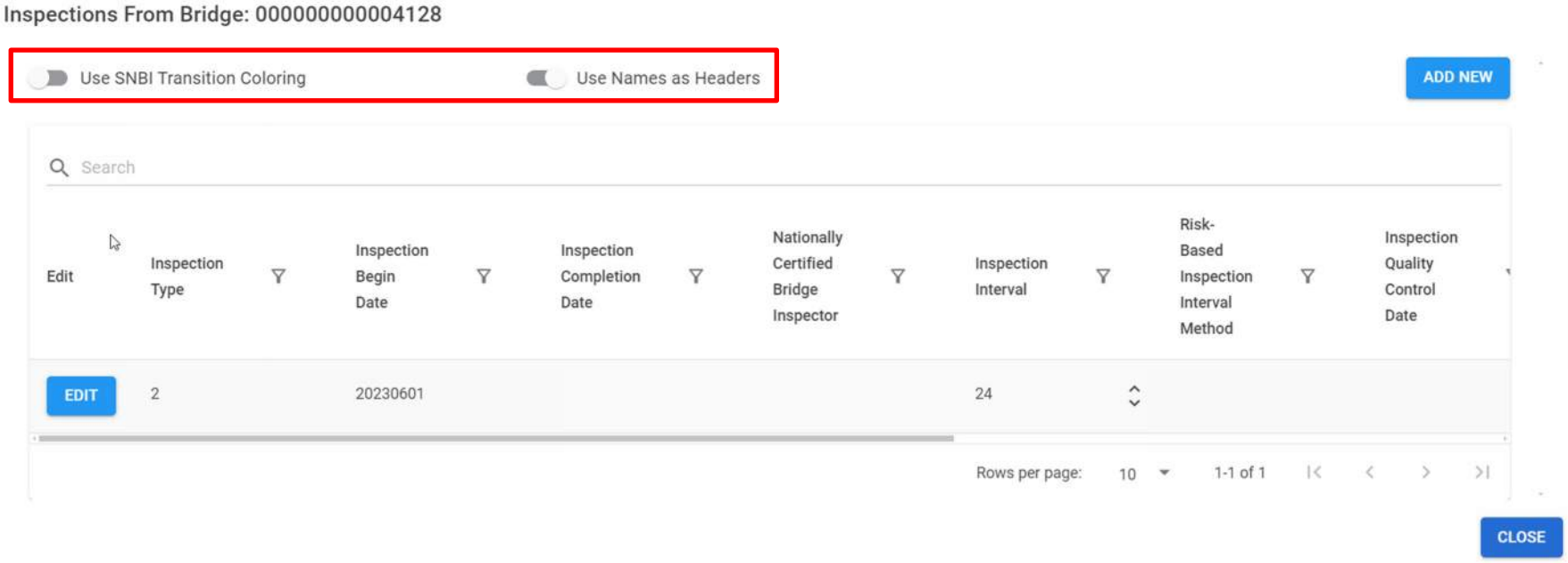


Figure H.10 SNBI Collector Configuration Options (SNBI Transition Coloring Off, Use Names as Headers On)

Step 4A: Updating Roadside Hardware Fields (B.RH.01 and B.RH.02)

1. Open the Bridge List and Search/Find your Bridge
2. Press the EDIT button for the bridge you want to update Roadside Hardware Fields (EDIT)
3. Scroll Down to find B.RH.01 and B.RH.02 Fields on the Edit Bridge Pop-up
4. Edit B.RH.01 and B.RH.02 Fields per the flowcharts provided at the end of this Appendix (Figure H.22 and Figure H.23)
5. If you need to Restore/Undo Update Value, Press ( )
6. Once complete, Press Validate and Review Errors (for those fields only) (VALIDATE)
   (Ignore Critical Validation Error, Only Review Fields Updated)
7. After Validation, Press Mark Field as Transitioned ( )
8. Press Save (SAVE)

Figure H.11 Bridge List, Finding a Bridge to Edit (Roadside Hardware)

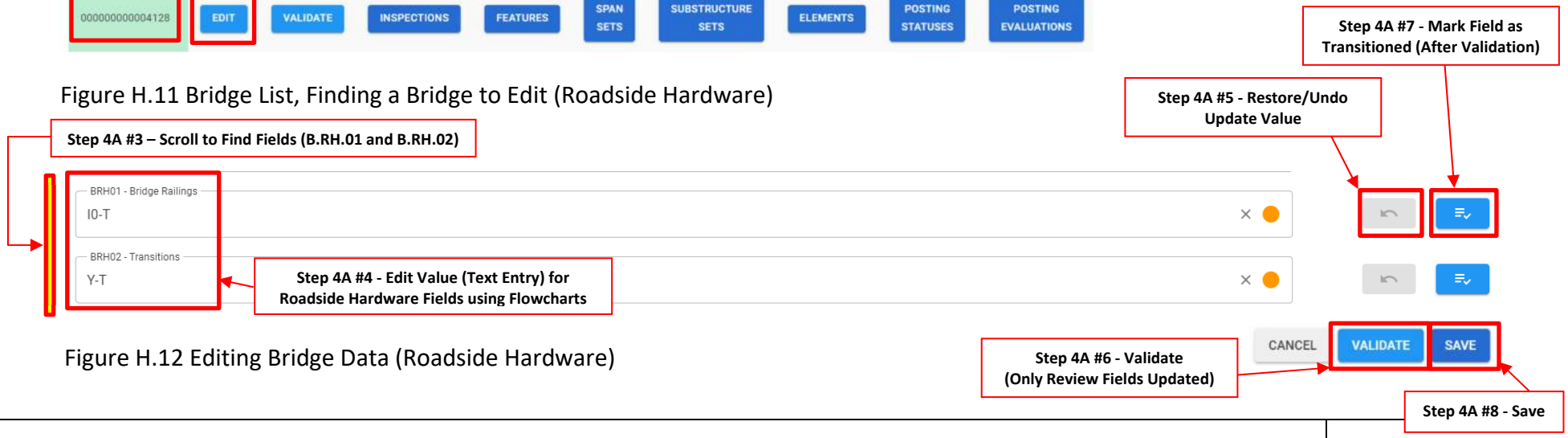


Figure H.12 Editing Bridge Data (Roadside Hardware)

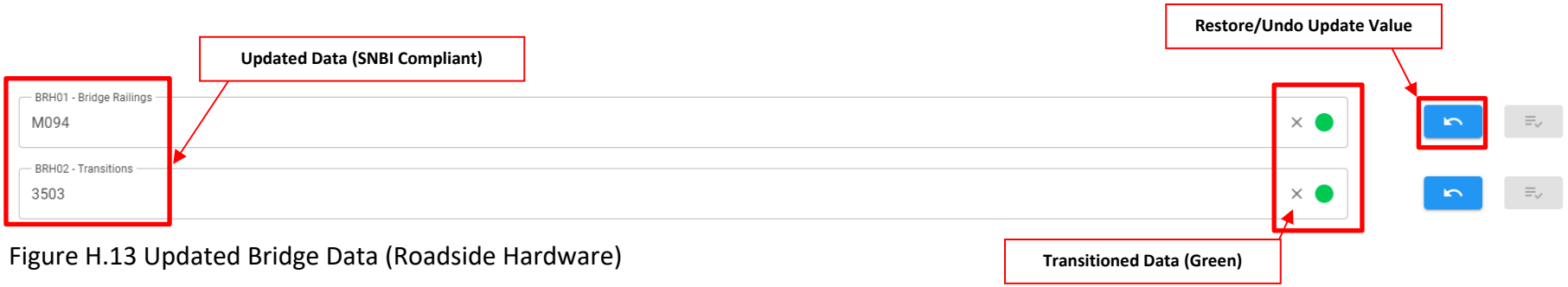


Figure H.13 Updated Bridge Data (Roadside Hardware)

Step 4B: Updating Substructure Data Set

1. Open the Bridge List and Search/Find your Bridge
2. Press Substructure Sets (SUBSTRUCTURE SETS)
3. Press Add New (ADD NEW)
4. Update Fields Using SNBI, Plans, Labeling Diagram and Field Notes (if needed)
5. If you need to Restore/Undo Update Value, Press ( )
6. Once complete, Press Validate and Review Errors (for those fields only) (VALIDATE) (Ignore Critical Validation Error, Only Review Fields Updated)
7. Press Save (SAVE)

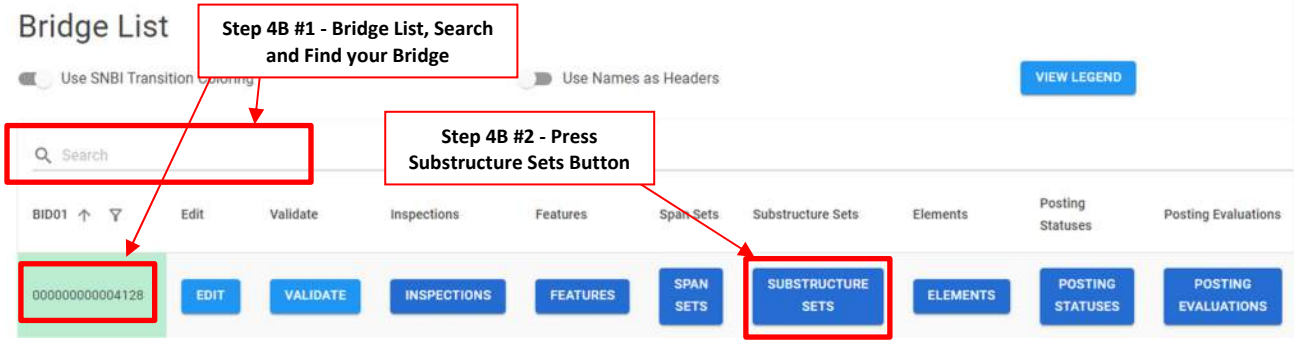


Figure H.14 Bridge List, Finding a Bridge to Edit (Substructure)

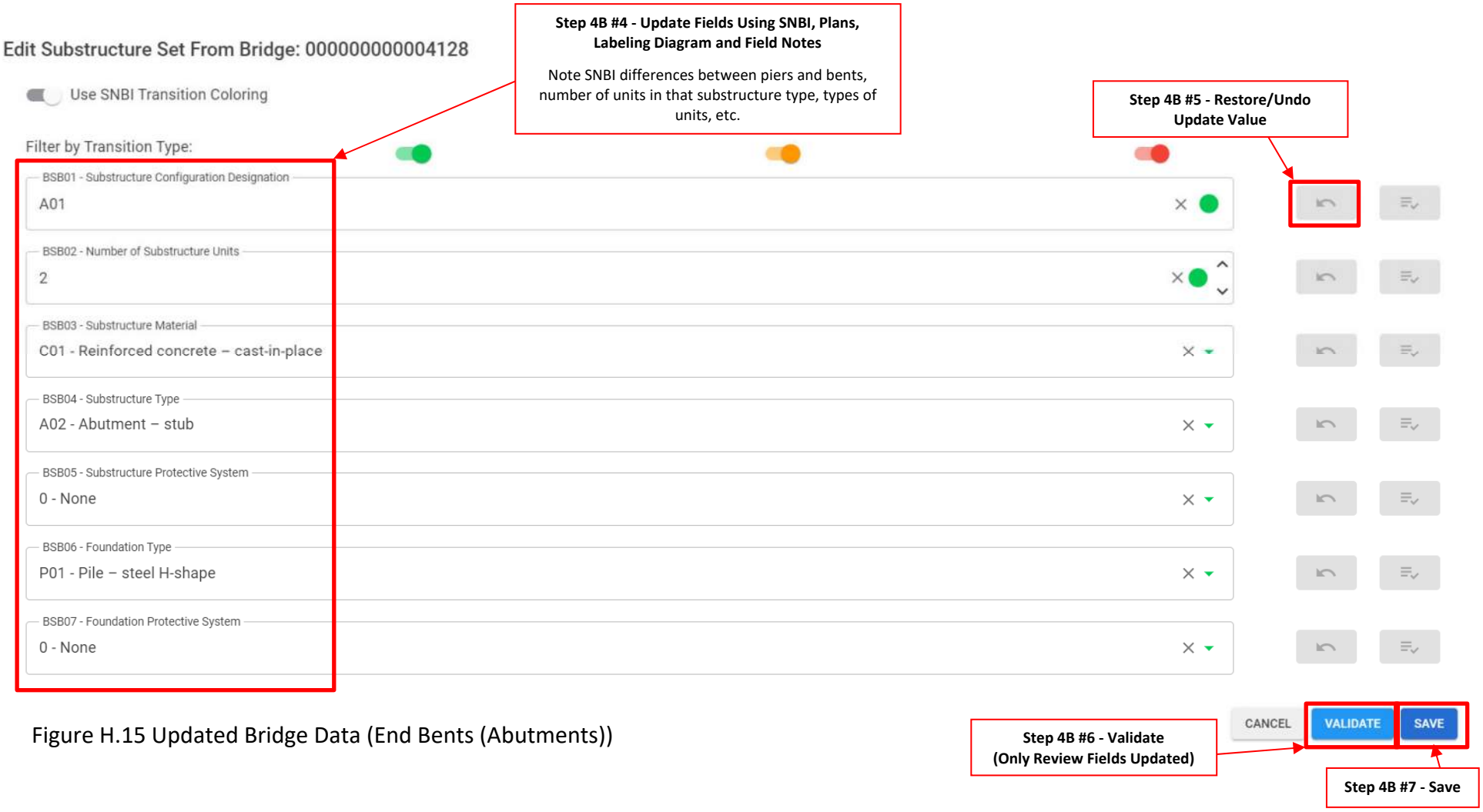


Figure H.15 Updated Bridge Data (End Bents (Abutments))

Figure H.16 Updated Bridge Data (Bents)

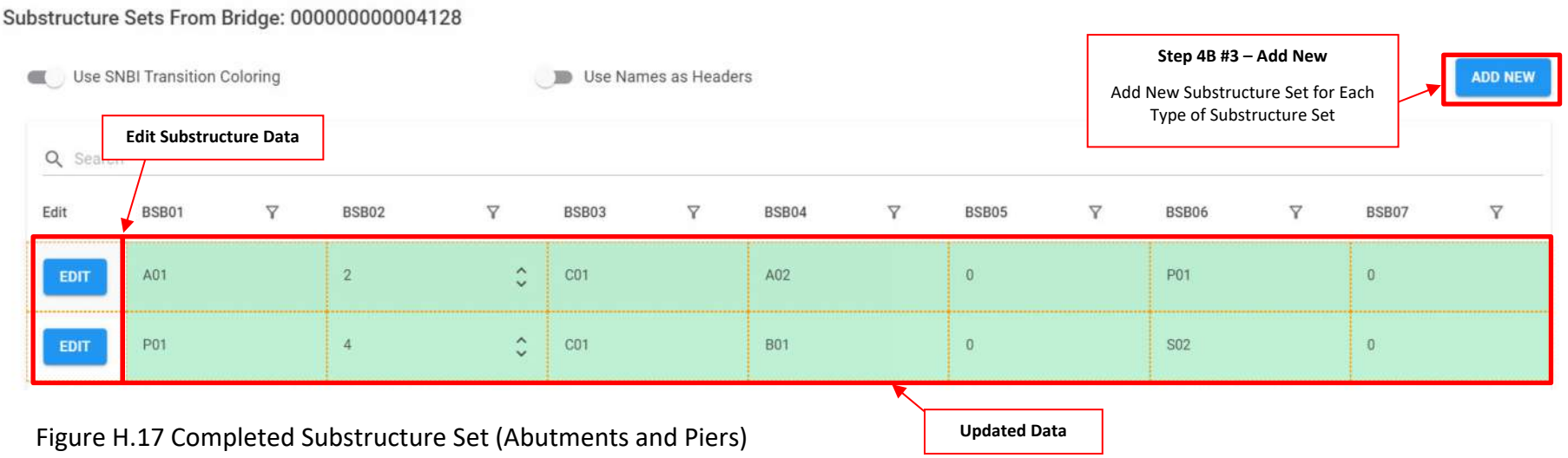


Figure H.17 Completed Substructure Set (Abutments and Piers)

Step 5: Upload to Cloud

1. Press **Upload**
2. Press **Sync**

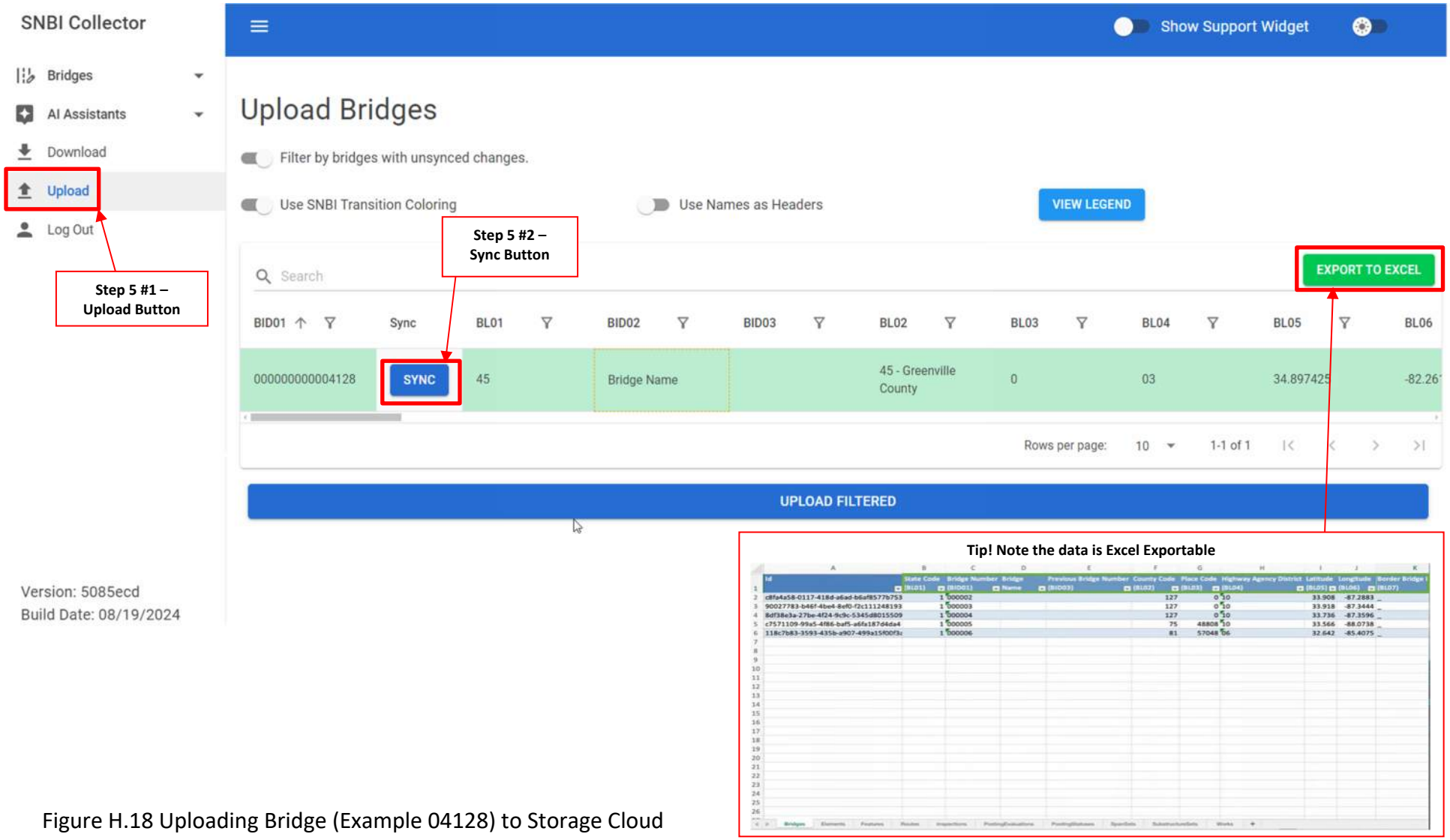


Figure H.18 Uploading Bridge (Example 04128) to Storage Cloud

AI Data Assistant

Note that there is an AI Assistant to help, feel free to ask a question about the SNBI Guide. This can help you search the SNBI Guide and help you find what you need in the SNBI. You can also upload PDFs and have the AI Assistant search the PDF and learn from the content. You can also have the AI Assistant search your data downloaded in the Bridge List using the "Data" button. You can ask AI to "Show me all bridges with a single span." **Strongly recommend AI for help with coding.**

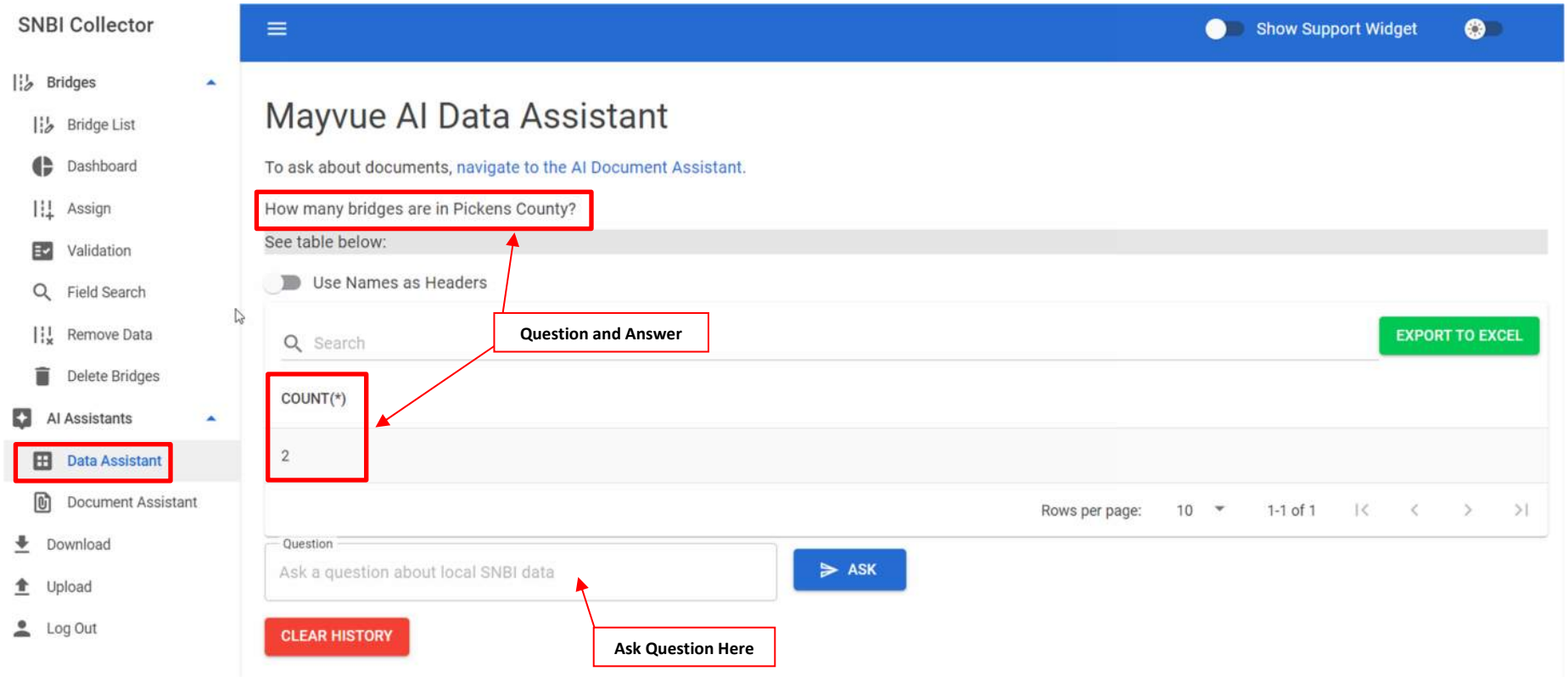


Figure H.19 Mayvue AI Assistant (Data)

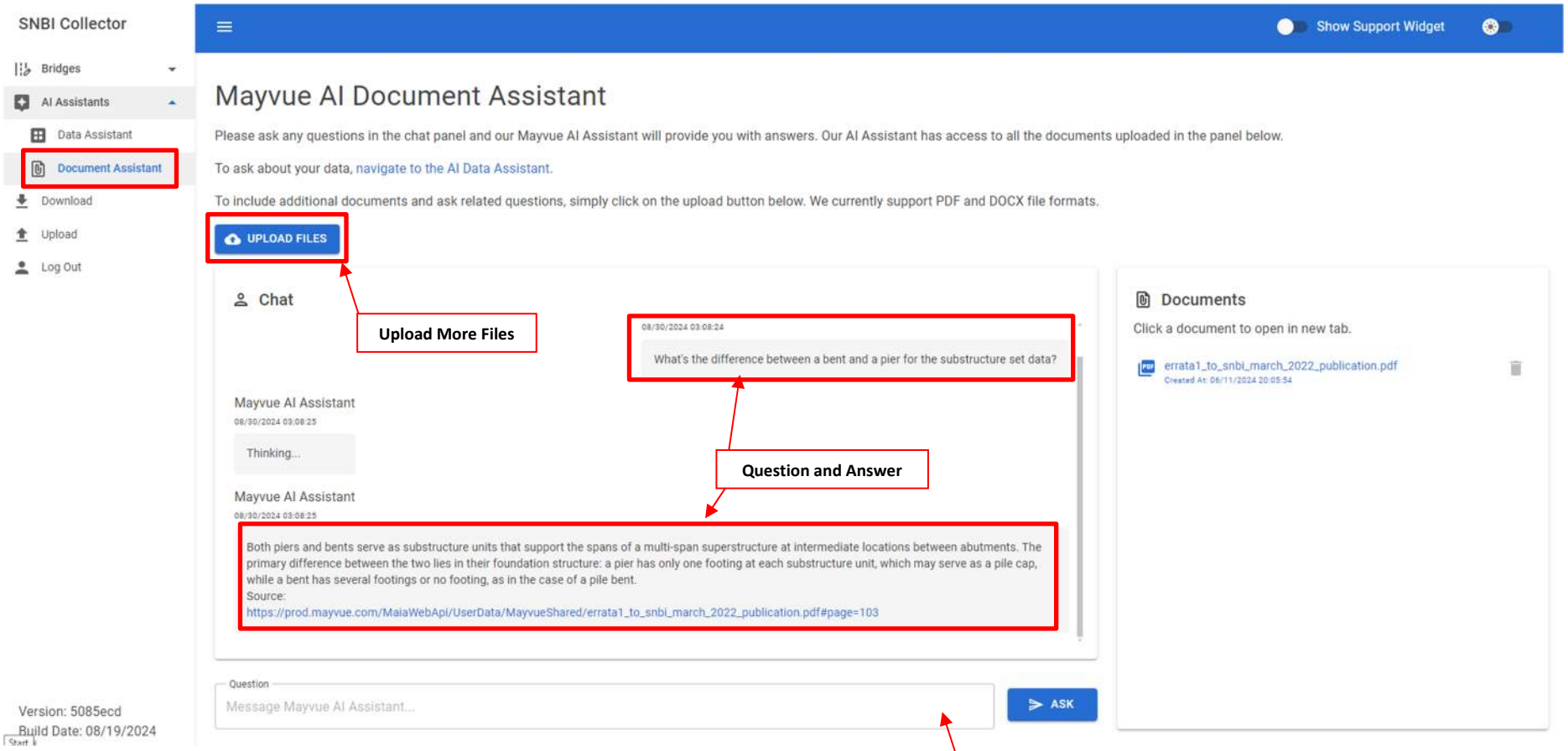


Figure H.20 Mayvue AI Assistant (Documents)

SNBI Collector Legend

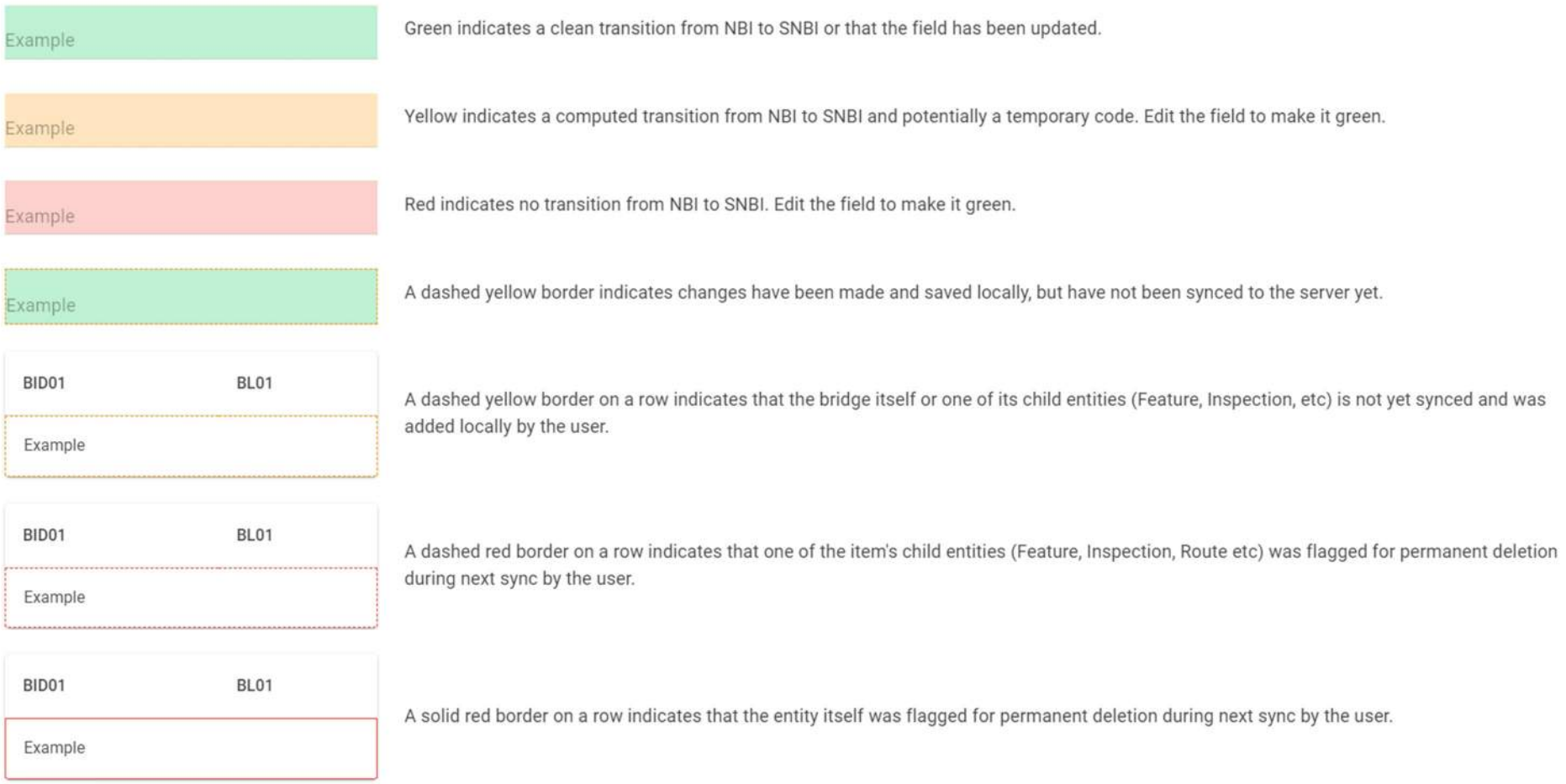


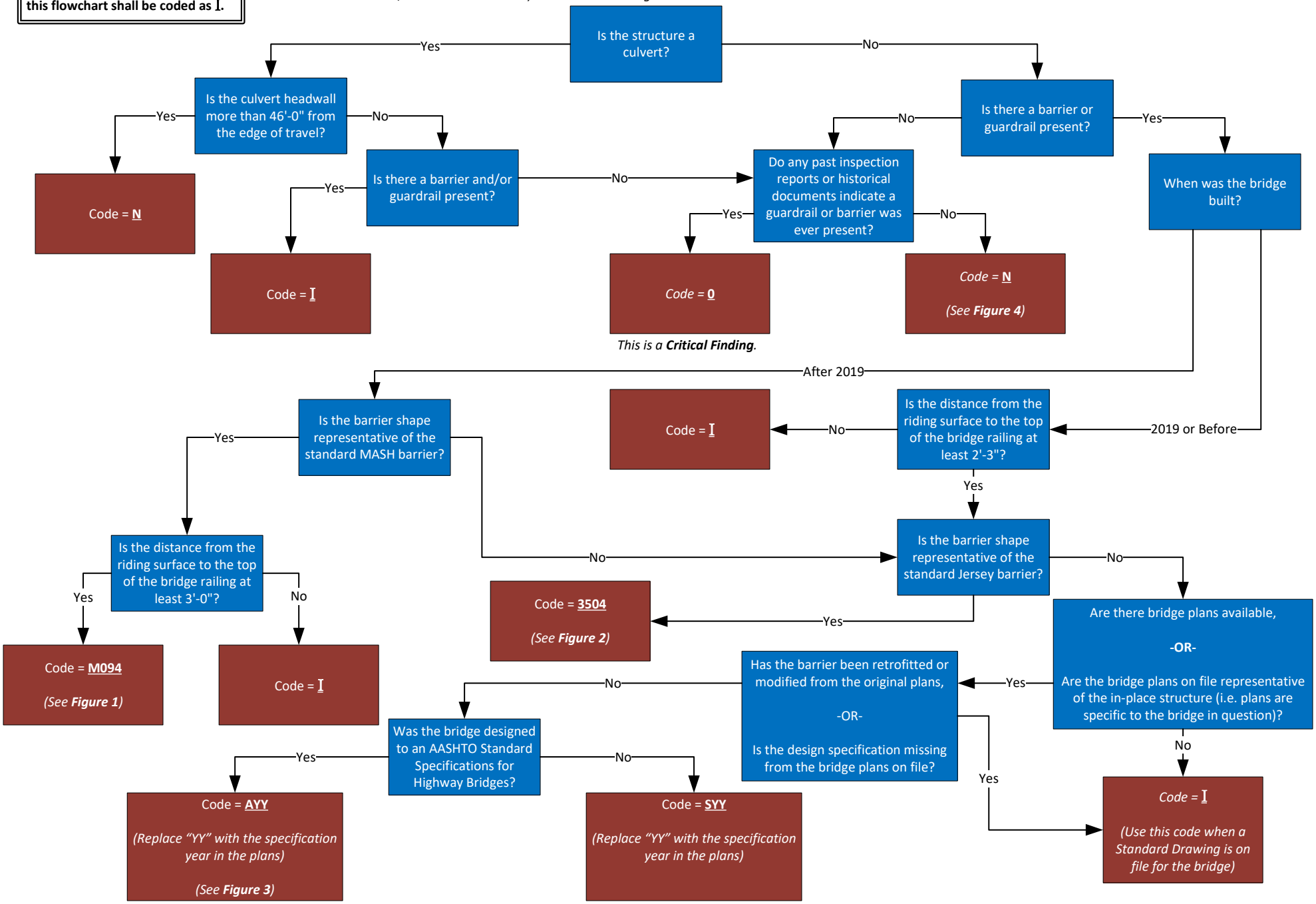
Figure H.21 SNBI Collector Legend

Figure H.22

B.RH.01 – Bridge Railings

Any scenario not covered within this flowchart shall be coded as I.

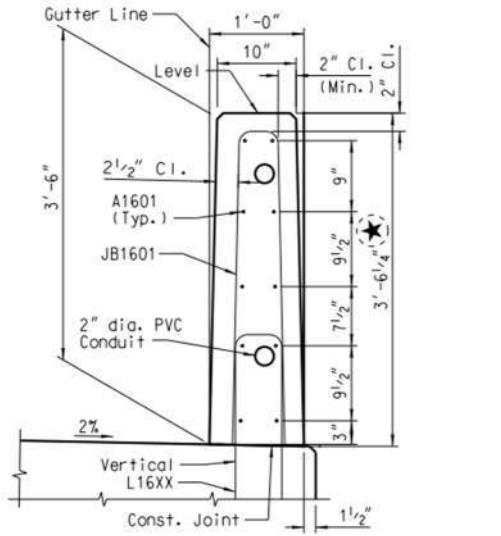
Bridge Railings - This roadside hardware includes all types and shapes of bridge railings (parapets, median barriers, or structure mounted) located on the bridge or that cross over culverts.



B.RH.01 – Bridge Railings – List of Figures

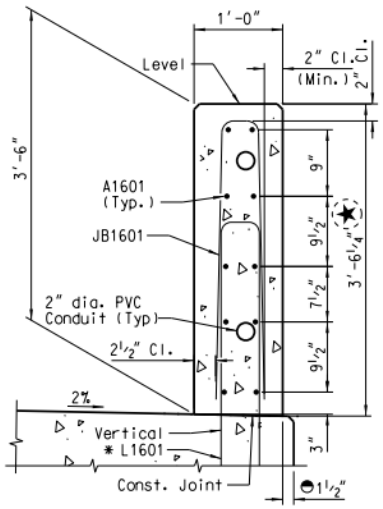
Figure 1 – Code **M094**

Slip-Formed MASH Barrier



SECTION THRU BARRIER
(Slab Reinforcing not Shown)

Hand-Formed MASH Barrier

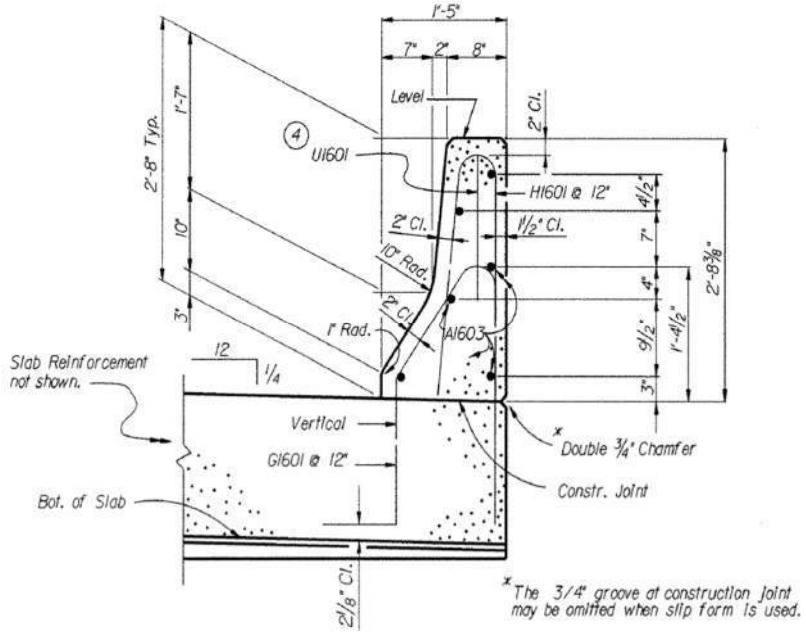


SECTION THRU
VERTICAL BARRIER
(Slab Reinforcing and Asphalt Inlay not Shown)

MASH Barrier in-place

Figure 2 – Code **3504**

Example from Bridge Plans



BARRIER PARAPET DETAILS

Jersey Shape Barrier in-place

Figure 3 – Code **AYY** (Replace "YY" with the Specification Year in the Plans)

** Design specifications found on the standard notes and/or standard details sheets in the bridge plans*

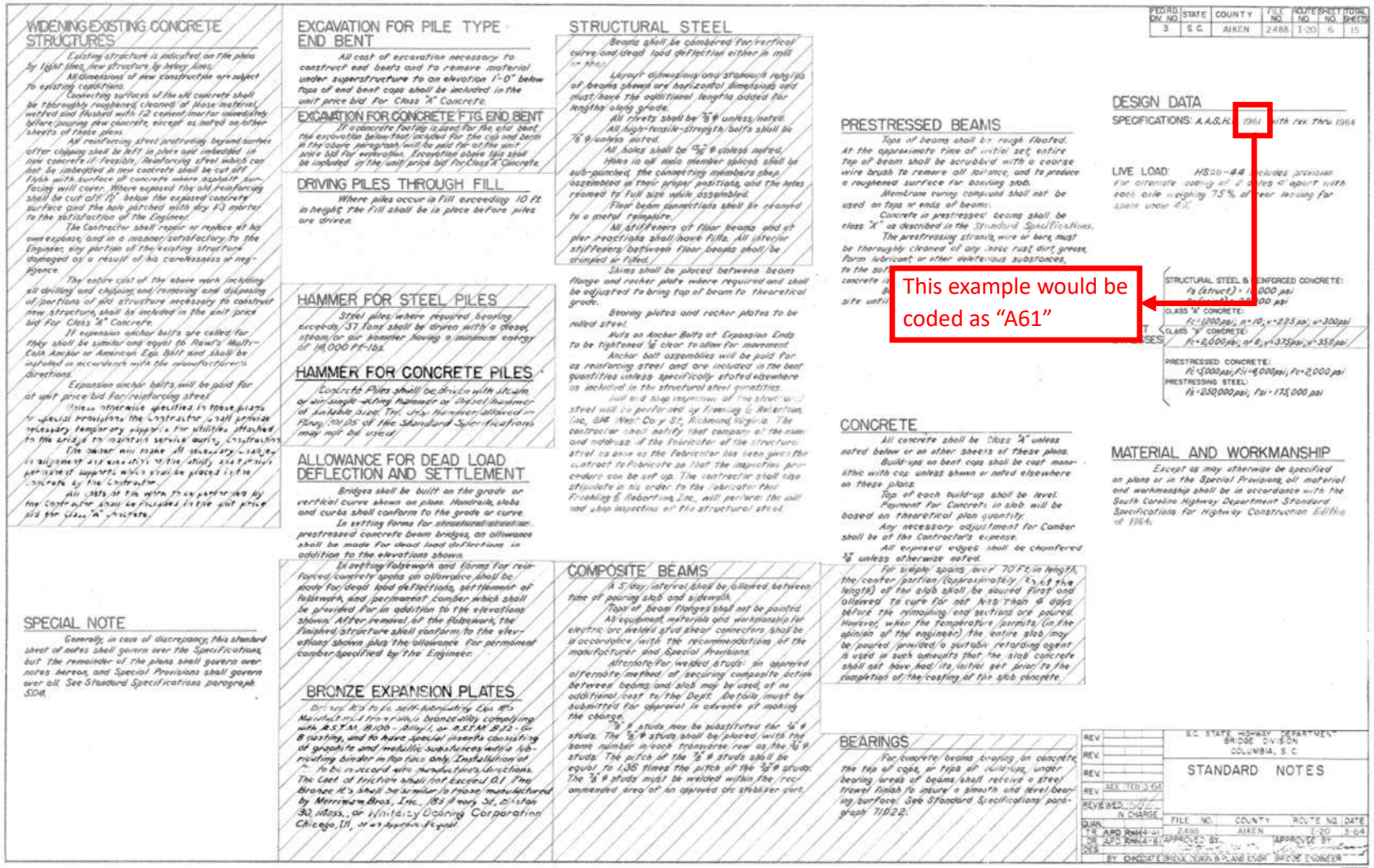


Figure 4 – Code **N**

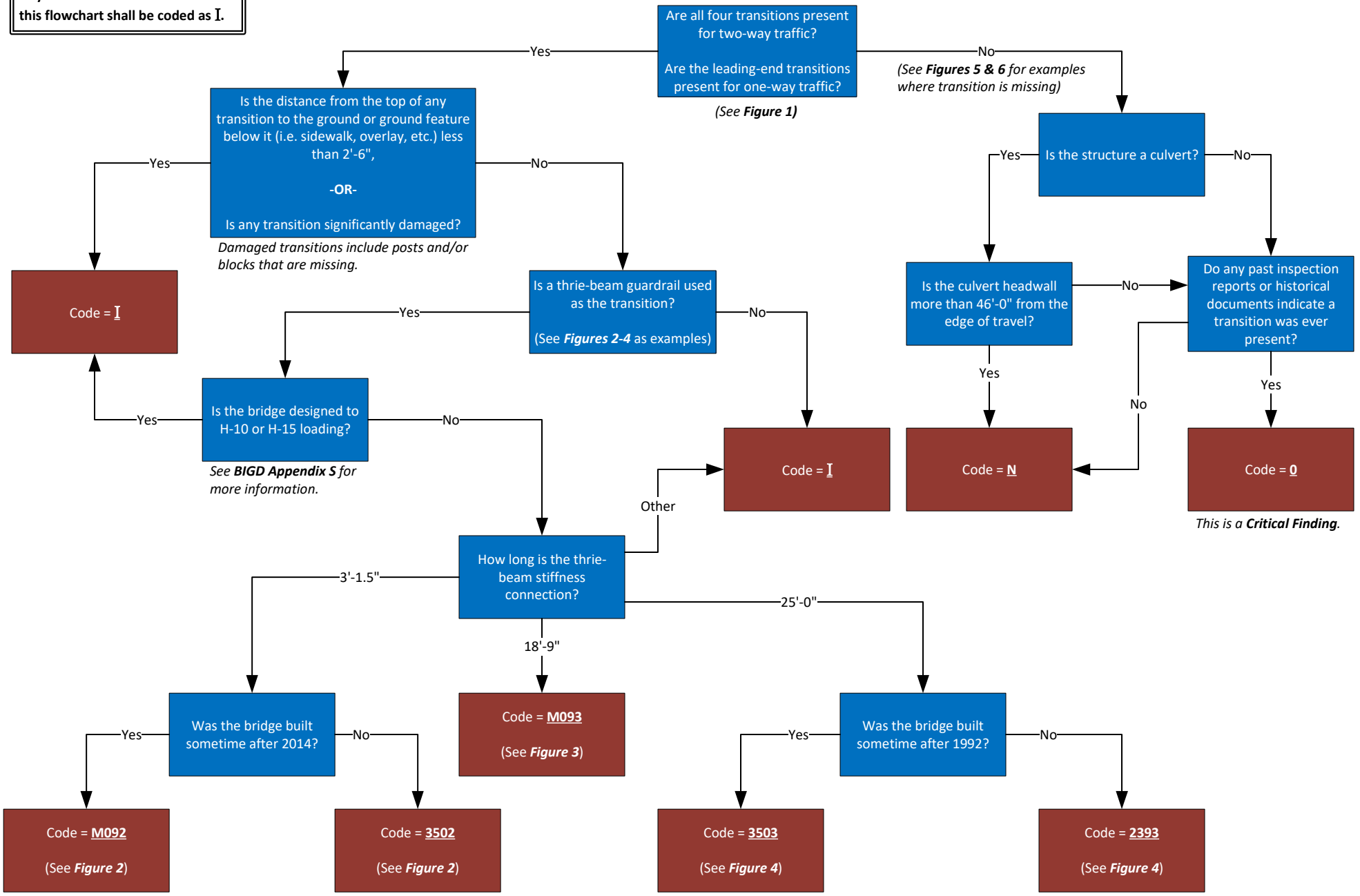
**In field examples of structures with no qualified bridge railing with no evidence of railing ever present.*

Figure H.23

B.RH.02 - Transitions

Transitions - This roadside hardware serves as the transition from the roadside approach railing to the bridge railing and is firmly attached and anchored to the bridge railing to provide sufficient tension in the transition rail upon impact.

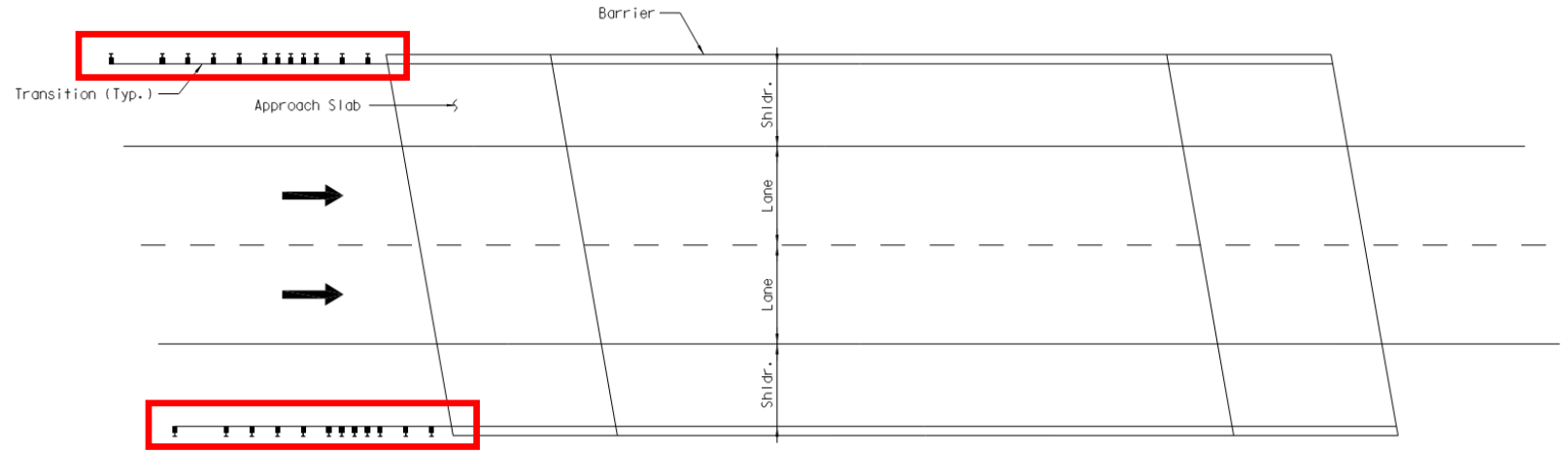
Any scenario not covered within this flowchart shall be coded as I.



B.RH.02 – Transitions – List of Figures

Figure 1 – Transitions for One-Way and Two-Way Traffic

One-Way Traffic Transitions



Two-Way Traffic Transitions

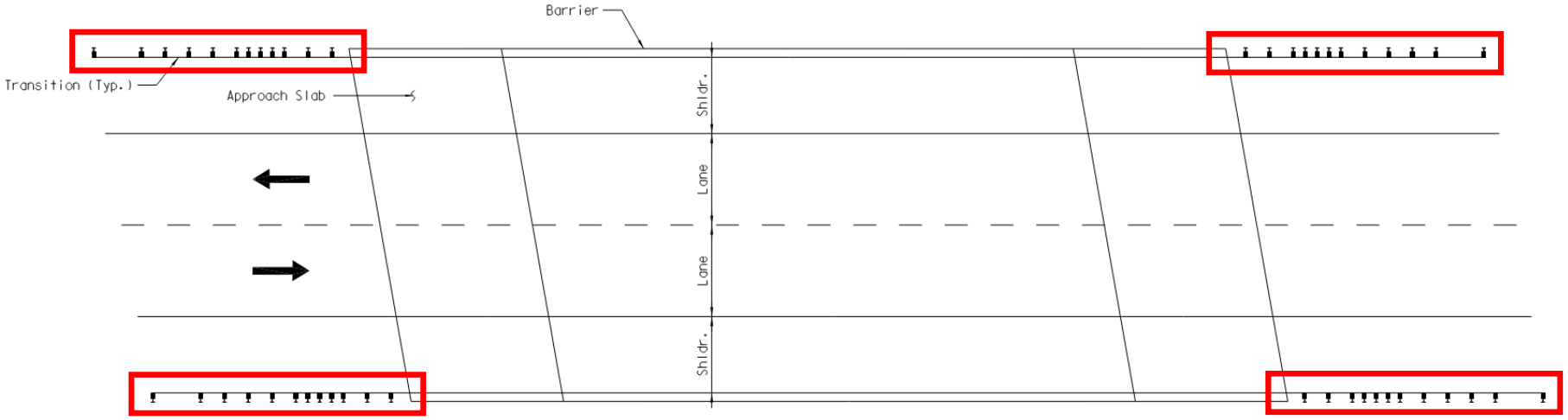


Figure 2 – Code **M092** or **3502**

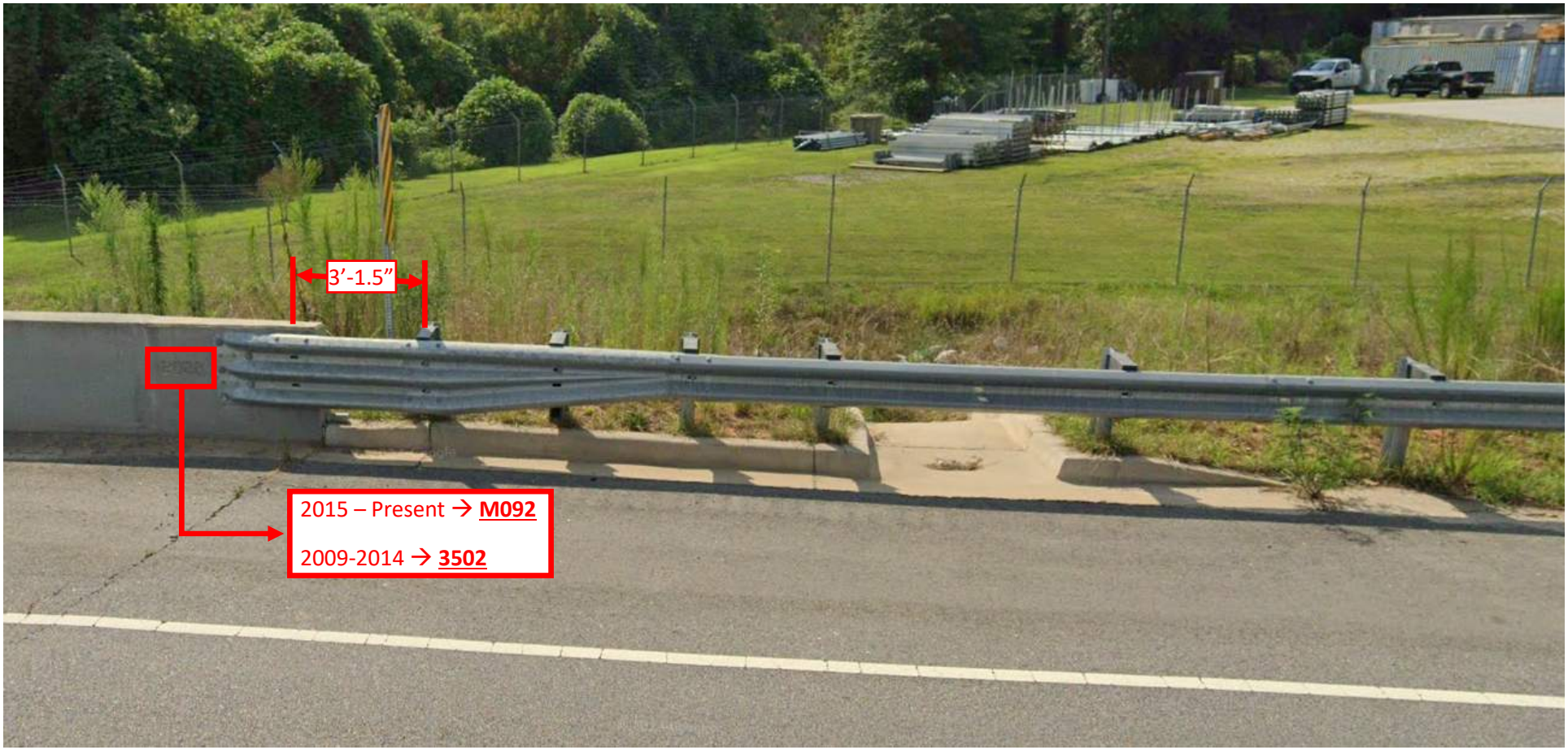


Figure 3 – Code **M093**

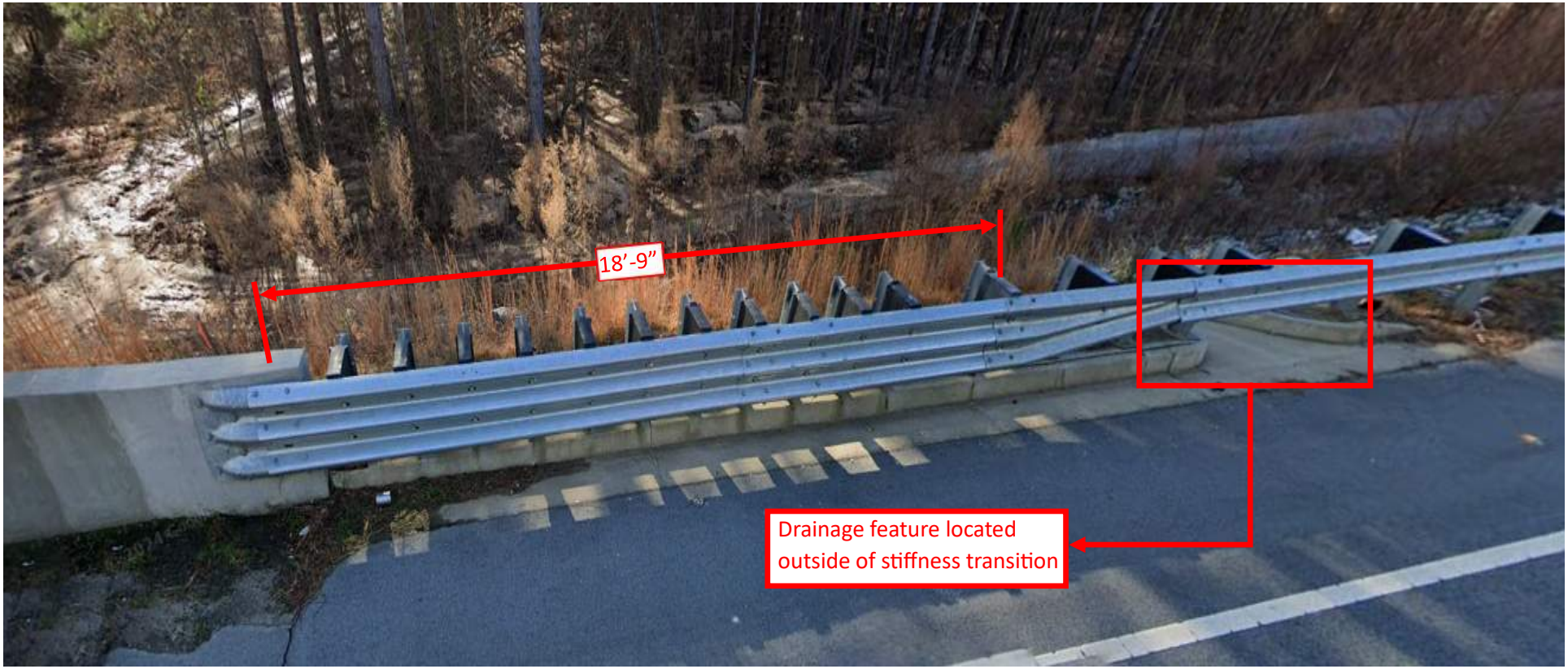


Figure 4 – Code **3503** or **2393**

Figure 5 – Code **0** or **N**

Figure 6 – Code **0** or **N**

APPENDIX S

Appendix/Attachment Title

Memordaum Regarding Maintenance of Guardrail on H-10 and H-15 Bridges

Appendix/Attachment Revision and Year:

Version 1.0, 2022

Appendix/Attachment Introduction and Discussion

The November 10, 2010, memordaum from SCDOT included guidance on maintenance for barrier, approach railing, and end treatments on bridges designed for H-10 or H-15 loading.

Appendix/Attachment Description

Since this internal memorandum may not be available to parties outside of SCDOT, it is being included as a reference if needed.

South Carolina Department of Transportation

MEMORANDUM

TO: District Engineering Administrators

FROM: James J. Feda, Jr., Director of Maintenance

DATE: November 17, 2010

RE: Maintenance of Guardrail on H10 and H15 Bridges

This memorandum is intended to provide guidance for situations that arise when making repairs to guardrail and end treatments on H10 and H15 bridges. These bridges were not designed to accommodate our current guardrail design configurations as detailed in the SCDOT Standard Drawings. In many cases, methods required to install or upgrade the bridge rail to current standards have not been certified as NCHRP 350 compliant. Upgrading or installing bridge rail on these bridges in accordance with our current standards can be very expensive, especially considering the remaining life expectancy of these types of bridges. Additionally, installing guardrail in accordance with current design standards may be detrimental to other aspects of the bridge performance, such as roadway width.

In light of this fact, it should be standard practice to repair the guardrail and approach rail on these bridges in accordance with the bridge's original design, including post spacing. One modification to the original design that should be considered is nesting of the W-beam bridge rail. Nesting is an acceptable means to increase the strength and reduce the deflection of W-beam rail placed along the bridge. If the bridge rail was previously upgraded to some standard above the original design, then that existing compliment of rail and post spacing should be used when making repairs. The addition of end treatments to the existing rail is acceptable; however, the installation of rail on a bridge where no rail exists should be in accordance with Engineering Directive #42.

Please do not hesitate to contact me if you have any questions or need additional clarification regarding this guidance.

JJF:dbc
cc: J.C. Watson, Chief Engineer for Operations
Mitchell Metts, Director of Preconstruction

File: MNT/DBC

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