



Pennsylvania Department of Transportation
Bridge Management System 2 (BMS2) Coding Manual

Pittsburgh, PA

HWY22MH003

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TRANSMITTAL LETTER

PUBLICATION:

Publication 100A, 2019 Edition

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SUBJECT:

Bridge Management System (BMS2) Coding Manual (Publication 100A)

INFORMATION AND SPECIAL INSTRUCTIONS:

This transmittal letter is to announce the release of the new *Bridge Management System 2 (BMS2) Coding Manual, Publication 100A, 2019 Edition* which will have a time neutral effect on bridge safety inspections. This edition will supersede the 2018 Edition (and subsequent revisions) of Publication 100A.

This coding manual is used by Department personnel, municipal engineers, and consultants whenever applicable and suitable for safety inspections of bridges, culverts, retaining walls, sign structures, and tunnels within the Commonwealth.

A list of incorporated Strike-off Letters is provided within the introduction of the publication. A summary of significant and key changes is in SOL 495-19-07 Publication 100A – BMS2 Coding Manual

CANCEL AND DESTROY THE FOLLOWING

Publication 100A (2018 Edition and all associated changes). Note, Publication 100A is only available electronically via the PennDOT website

ADDITIONAL COPIES ARE AVAILABLE FROM:

PennDOT website -www.penndot.gov
Click on Forms, Publications & Maps

APPROVED FOR ISSUANCE BY:

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Summary of Changes - 2019 Edition of Publication 100A

Change #	Item No.	Proposed Change
1	Various Screens	Changes documented in release notes since the September 10, 2018 BMS2 release have been incorporated in
2	Introduction	Updated direction of orientation definitions to refer to the sketch used in the current edition of Publication 100A. Previously, definitions still referenced sketches from the "Green Book."
3	Section 2	Update BMS2 website links following the WAS9 upgrade.
4	2.5	Fixed the numbering of figures within Section 2.5
5	2.14	Clarified when a new BRKEY is required for rehab/replacement projects.
6	2.15.3	Explained how to refresh a notification in BMS2
7	1A07	Clarified 1A07 refers to spalling in the top of the deck.
8	4A02	Add '0 - Bridge Closed' to the coding options.
9	4A08	Clarified 4A08 should be set to "N" for signs, walls, and other non-highway structures.
10	4A08b	Clarified that 4A08=6 will be Category A.
11	4B01	Clarified how to code design load when the bridge has been reconstructed.
12	5A16	Removed reference to AP Screen
13	5A24	Added new field writeup for this field located on the Structure Home page.
14	5B01	Clarified the coding of 9-Other based on clarification from FHWA for PSNCABB bridges.
15	5C08	Clarified the "description" narrative for this field to focus on "highway traffic lanes open to the public."
16	5C15	Coding for this field has been modified to clarify it is required for each on-feature that carries highway traffic.
17	5C22	Clarified that 99-Ramp should only be used for 9XXX series SRs. Clarified 8XXX series.
18	5C22	Add codes 03 and 18. Revised all descriptions to match BMS2
19	5D02	Clarified the required structure units for a bridge or culvert, based on the coding of 6A29.
20	5D04	Revised the coding for this field to clarify the use on culverts.
21	5E01	Revised the coding to clarify how a coding of "N" is used in addition to structures being less than 20' in length. Also added clarifications based on the service type on a structure.
22	5E04	Revised coding for 6 to match BMS2
23	6A19	Clarified bridges should be coded based on the facility carried, not the facility crossed.
24	6A29	Match the Publication to BMS2 options (typo in 2018 Edition).
25	6A29	Clarified the coding of 6A29 for bulb tees.
26	6A41	Clarified the coding of both fields to indicate these fields are related to "deck joints" on the bridge.
27	6A45-6A49	Clarified the use of these fields for non-steel structures. Publication 238 will be updated accordingly.
28	6A49	Clarified the description, procedure and coding to indicate the field is used for both the main and approach spans storing the data in two separate columns.
29	6C22-6C23	Revised the description of these fields to indicate the field is required and the coding must be greater than or equal to 0. The field cannot be left blank or be equal to -1.
30	6C34	Revised the coding to add "4 - Other" and clarified how the coding is to be used. Also clarified the use of "1 - Highway."
31	7A06	Clarified the use of the element check box. The box must be checked for elements to upload from iForms to BMS2.
32	FR10 through FR15	Update to reference "railroads" and not roadways. Removed FR10, FR12, FR14, and FR15 as they are not used for railroads. Also updated associated sketches to reflect a railroad and not a highway.
33	IL13	Clarified the use of "C". This is specific to the bridge site and it's approaches.
34	IM03	Listed available maintenance action by SERVYTPON.
35	IM03	Added PPC, Overlay, and Damage maintenance items.
36	IR04, IR06, IR10, IR11	Clarified that temporary bridges should have IR06 coded as 7-Engineering Judgment on the Gross Load Only NBI Rating Vehicle.
37	D491's	Updated screenshots with revisions to the underwater screens by adding IN01 to the left of IN19.



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION

BUREAU OF MAINTENANCE AND OPERATIONS

**BRIDGE MANAGEMENT SYSTEM 2
(BMS2)**

CODING MANUAL

OFFICE VERSION



2019 EDITION

Pub. No. 100A

TABLE OF CONTENTS

Incorporated Strike-Off Letters (SOL)..... vi

Definitions..... vii

1.0 Introduction1-1

 1.1 Background.....1-1

 1.2 BMS2 Configuration1-2

 1.3 Purpose of Manual.....1-2

 1.4 Distribution Procedure.....1-2

 1.5 BMS2 Security Levels1-3

 1.5.1 BMS2 Security Levels1-3

2.0 BMS22-1

 2.1 Introduction.....2-1

 2.2 BMS2 Security and Login.....2-1

 2.2.1 BMS2 Security for External Users.....2-1

 2.2.1.1 Business Partner Registration - Non-PennDOT BMS2 Users.....2-1

 2.2.2 BMS2 Security for PennDOT Users.....2-1

 2.2.2.1 Business Partner Registration -PennDOT BMS2 Users.....2-2

 2.2.3 BMS2 Security Levels2-2

 2.2.4 BMS2 Security Groups2-2

 2.2.5 BMS2 Business Partner Assignment2-3

 2.2.6 BMS2 Application Login.....2-4

 2.2.7 BMS2 Access to Risk Score2-5

 2.2.8 Structure Plan Number2-5

 2.3 System Basics.....2-6

 2.3.1 Things You Can't Do In BMS2.....2-6

 2.3.2 Field Label Prefixes2-6

 2.3.3 Common Functions and Navigation.....2-8

 2.3.3.1 Header and Footer Links.....2-8

 2.3.3.2 Common Header Go Buttons2-9

 2.3.3.3 Quick Links2-9

 2.3.3.4 Common Screen Buttons2-10

 2.3.3.5 Required Entry Fields2-10

 2.3.4 Structure Search2-10

 2.3.4.1 Saved Searches.....2-11

 2.3.5 Structure List2-11

 2.4 Inventory Screens.....2-13

 2.4.1 Structure Home.....2-13

 2.4.2 Agency Bridge.....2-14

 2.4.3 Features Intersected.....2-15

 2.4.3.1 Features Intersected List.....2-15

 2.4.3.2 Roadway Detail2-16

 2.4.3.3 Waterway Detail.....2-17

- 2.4.3.4 Railroad Detail2-18
- 2.4.3.5 Utility Detail.....2-19
- 2.4.4 Structure Units2-20
 - 2.4.4.1 Structure Unit / Span List.....2-20
 - 2.4.4.2 Structure Unit / Span Detail.....2-21
- 2.4.5 Drawing Notes2-22
 - 2.4.5.1 Drawing General Information and List.....2-22
 - 2.4.5.2 Drawing Detail2-23
- 2.4.6 Posting.....2-24
 - 2.4.6.1 Posting List.....2-24
 - 2.4.6.2 Posting Detail.....2-25
- 2.4.7 Inspection Planning.....2-26
 - 2.4.7.1 General Information and Lists.....2-26
 - 2.4.7.2 Equipment Detail2-27
 - 2.4.7.3 Permit Detail2-28
- 2.4.8 Design.....2-29
 - 2.4.8.1 Design Information and Lists2-29
 - 2.4.8.2 Design - Pier Type Detail.....2-31
 - 2.4.8.3 Design - Culvert Detail2-31
 - 2.4.8.4 Design - Expansion Joint Detail.....2-32
- 2.4.9 Inventory - Signs and Lights2-33
- 2.4.10 Inventory - Walls.....2-34
- 2.4.11 Paint.....2-35
 - 2.4.11.1 Paint History2-35
 - 2.4.11.2 Paint Detail.....2-36
- 2.4.12 Inventory - Tunnels2-37
- 2.4.13 Risk Score.....2-38
 - 2.4.13.1 Risk Score Detail.....2-38
- 2.4.14 Structure Group2-39
- 2.5 Inspection Screens.....2-40
 - 2.5.1 Selecting an Inspection.....2-40
 - 2.5.2 Ratings & Schedule.....2-41
 - 2.5.2.1 Ratings & Schedule Screen.....2-41
 - 2.5.2.2 Key Field Comparison2-42
 - 2.5.3 Agency Inspection2-43
 - 2.5.4 Notes & Comments2-44
 - 2.5.4.1 Comment Lists and Notes.....2-44
 - 2.5.4.2 Inspection Comment Detail2-45
 - 2.5.4.3 Inspection Structure Unit Comment Detail2-46
 - 2.5.5 Element Condition.....2-47
 - 2.5.5.1 Element List.....2-47
 - 2.5.5.2 Element Detail.....2-48
 - 2.5.6 Load Rating2-49
 - 2.5.6.1 General Information and List2-49

- 2.5.6.2 Load Rating Detail2-50
- 2.5.7 Fracture Critical2-51
 - 2.5.7.1 General Information and List2-51
 - 2.5.7.2 Fracture Critical Detail2-52
- 2.5.8 Underwater.....2-53
 - 2.5.8.1 General Information and List2-53
 - 2.5.8.2 Underwater Subunit List.....2-54
 - 2.5.8.3 Underwater Subunit Details2-55
 - 2.5.8.4 Underwater Other Details Screen2-56
- 2.5.9 Inspection – Signs & Lights2-57
- 2.5.10 Inspection – Walls.....2-58
- 2.5.11 Signing Details2-59
 - 2.5.11.1 Signing Lists and Notes2-59
 - 2.5.11.2 Signing Detail Comment Detail.....2-60
- 2.5.12 Safety Features2-61
 - 2.5.12.1 Safety Features List2-61
 - 2.5.12.2 Safety Feature Comment Detail.....2-62
- 2.6 Bridge-Related EDMS Documents2-63
 - 2.6.1 EDMS Document List.....2-63
 - 2.6.2 EDMS Document Upload2-65
 - 2.6.2.1 Edit Uploaded EDMS Document2-66
 - 2.6.3 Link EDMS Document2-67
 - 2.6.4 Link Project Document2-67
- 2.7 Maintenance2-68
 - 2.7.1 Proposed Maintenance List Screen2-68
 - 2.7.2 Proposed Maintenance Detail Screen2-69
 - 2.7.3 Sending Proposed Bridge Maintenance Activities to SAP.....2-69
 - 2.7.4 Completed Maintenance List Screen.....2-70
 - 2.7.5 Completed Maintenance Detail Screen.....2-71
 - 2.7.6 Coding Completed Maintenance Items in BMS22-71
- 2.8 Assigning Business Partners2-72
 - 2.8.1 Assign Business Partners to an Individual Structure2-72
 - 2.8.2 Assign Business Partners to Multiple Structures2-73
- 2.9 Bulletin Board Screen2-74
- 2.10 Validations2-75
 - 2.10.1 Inspection Acceptance2-76
 - 2.10.2 Validation Levels2-76
- 2.11 Report Screen.....2-76
 - 2.11.1 BMS2 Report Screen2-76
 - 2.11.2 Crystal Reports.....2-77
- 2.12 iForms and BMS2 Web2-78
 - 2.12.1 iForms BMS2 Web Userid and Password.....2-78
 - 2.12.2 iForms EDMS Document Download2-79
 - 2.12.3 iForms Data Services Screen.....2-79

- 2.12.4 Electronic Documents Screen.....2-81
- 2.13 Risk Score2-83
 - 2.13.1 Accessing Risk Score2-83
 - 2.13.1.1 From the Structure Search Menu2-83
 - 2.13.1.2 From a Bridge File2-84
 - 2.13.1.3 From a Structure File.....2-84
 - 2.13.2 Running a Risk Score Search.....2-85
- 2.14 Structure Management.....2-86
 - 2.14.1 Creating a New Structure2-86
 - 2.14.2 BMS2 Structures Removed from Service.....2-88
- 2.15 Email Notifications2-89
 - 2.15.1 Accessing Email Notifications in BMS2.....2-89
 - 2.15.2 Subscribing to Email Notifications.....2-90
 - 2.15.2.1 Explanation of Email Notification Terms.....2-90
 - 2.15.3 Notifications2-91
- 2.16 APRAS Data.....2-92
 - 2.16.1 APRAS Data Screen.....2-92
 - 2.16.2 APRAS Span Detail2-93
 - 2.16.3 APRAS Span Clearance2-94
 - 2.16.4 APRAS Permit Conditions2-94
- 3.0 BMS2 Field Groups3-1
 - 1A - Inspection Condition3-3
 - Condition Rating Codes.....3-4
 - Culvert Condition Rating3-7
 - 1B - Inspection Condition - Create/Edit Element3-15
 - 2A - Inspection Notes3-17
 - 3A - Inspection Work3-19
 - 3B - NBI Project Data3-21
 - 4A - Inspection Appraisal - Other Ratings3-25
 - Appraisal Rating Codes.....3-25
 - 4B - Inspection Appraisal - Load Ratings.....3-45
 - 5A - Inspection Inventory - ID/Admin3-51
 - 5B - Inspection Inventory - Design.....3-65
 - 5C - Inspection Inventory - Roads.....3-75
 - 5D - Inspection Inventory - Structure Units.....3-93
 - 5E - Inspection Inventory - Classification.....3-97
 - 6A - Agency Bridge3-103
 - 6B - Agency Inspection3-129
 - Paint Condition Rating Codes.....3-139
 - Condition Rating Codes.....3-141
 - 6C - Agency Roadway.....3-149
 - 7A - Inspection Schedule3-167
 - VP - Inventory - Posting.....3-183
 - VA - Inventory - Paint.....3-189

VM - Inventory - Maintenance Responsibility.....3-195
 VD - Inventory - Design.....3-199
 VN - Inventory - Drawing and Notes3-215
 VI - Inventory - Inspection Planning.....3-219
 VS - Inventory - Signs / Lights3-227
 VT - Inventory - Tunnels.....3-235
 VW - Inventory - Walls3-237
 SG - Structure Group.....3-247
 IA - Inspection - Safety Feature.....3-249
 IR - Inspection - Load Rating3-257
 IT - Inspection - Load Rating / Tunnels3-269
 IF - Inspection - Fracture Critical3-271
 IU - Inspection - Underwater / OSA.....3-275
 IN - Inspection - Underwater / Sub Units3-289
 IL - Inspection - Underwater / Other3-303
 ID - Inspection - Signing Details3-309
 IC - Inspection - Comments.....3-313
 IM - Inspection - Maintenance3-317
 IS - Inspection - Signs / Lights.....3-353
 IW - Inspection - Walls.....3-361
 FT - Feature Intersected - Utility.....3-367
 FR - Feature Intersected - Railroad.....3-371
 FW - Feature Intersected - Waterway3-379
 SP - APRAS Span - Span3-387
 SS - APRAS Span - APRAS Span3-391
 SL - APRAS Span - Load Capacity.....3-399
 SC - APRAS Span - Clearance (Permit Conditions).....3-405
 SC - APRAS Span - Clearance (Clearance Details)3-407

- Appendix A - Create New Structures Form
- Appendix B - County, City, Borough and Township Codes
- Appendix C - Conversion Chart for BMS2, BMS and FHWA Items
- Appendix D - SNTI to BMS2 Conversion
- Appendix E - Crystal Reports Tables for BMS2 Items
- Appendix F -D450's (iForms) and D491's
- Appendix G - Stone Masonry Arch Condition Rating Guidelines
- Appendix H - National Bridge Elements
- Appendix I - PennDOT Agency Developed Elements
- Appendix J - NBE Coding Examples

Incorporated Strike-Off Letters (SOL)

The coding instructions in this edition of the Coding Guide supersede that contained in the following SOL's:

SOL	Date	Description
495-20-01	1/21/2020	Assigned Load Rating Method and Coding of the NBI Vehicle
495-20-03	3/31/2020	Extended and Reduced Inspection Interval
495-20-05	5/7/2020	Scour Measurements and Documentation
495-20-06	7/21/2020	Joints and Bearings Inventory and Inspection

Definitions

APRAS

Automated Permit Routing/ Analysis System

BIS

Bridge Inspection Section. The section of the Asset Management Division of the Bureau of Maintenance and Operations is responsible for Administrative and technical support of Pennsylvania bridge inspection and BMS2.

BMS2

Bridge Management System 2

BrM

A bridge management system owned by AASHTO and includes functionality for performing element-level inspections and data collection, and includes extensive planning and programming and predictive modeling functionality.

Bridge

For the purposes of this inventory, a bridge is defined as: A structure, including supports, erected over a depression or an obstruction, as water, highway, or railway and having a track or passageway for carrying traffic or other moving loads and usually having a length of 8 feet or more. Note: The terms "bridge" and "structure" are often used interchangeably. See BMS2 Item 5E01 for the FHWA definition of a bridge.

Data Item

A complete element of data, one or more data fields

Department

The Pennsylvania Department of Transportation

Direction of Orientation

Determine the right and left sides and near and far ends of the bridge by looking in the direction of increasing offset, stations, or increasing milepoints, see sketch adjacent to the definition for "Left Roadway" on the following page. (This is generally the direction of inventory). In the absence of offset, stations, or milepoints, determine orientation in accordance with cardinal direction. If the bridge runs west to east, the direction or orientation should be east . If the bridge runs south to north, the direction of orientation should be north. Reference the sketch on the following page adjacent to the definition for "Left Roadway."

DM2

The Pennsylvania Department of Transportation's Design Manual Part 2.

DM4

The Pennsylvania Department of Transportation's Design Manual Part 4.

ECMS

Engineering and Construction Management System

EDMS

Electronic Document Management System

FHWA

Federal Highway Administration

Field

A specific area in which a particular type of information is recorded. A single or multiple digit area used to define or describe an individual characteristic.

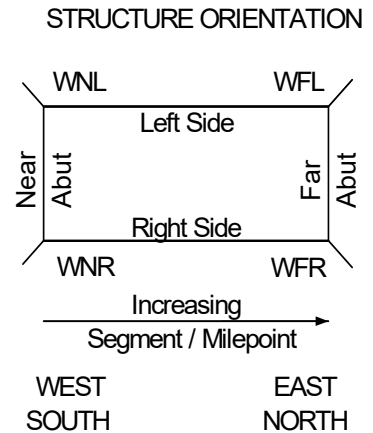
Left Edge

This is the left edge of the roadway as defined relative to the direction of traffic. See the sketches at the end of this section. This definition applies only for Minimum Lateral Clearance on Screen 4A. (This should not be

confused with the “left side” of the bridge as defined under Direction of Orientation which is used for Sidewalk Type and Width on Screens VI and 5B).

Left Roadway

This is used to identify the roadway relative to the direction of inventory (increasing offset, stations, or milepoints). In the absence of offsets, stations or milepoints, the direction should be south to north, or west to east. Therefore, in the absence of offsets, stations or milepoints Southbound (SB) and Westbound (WB) roadways are considered “Left Roadways”.



MORIS

Maintenance and Operations Resource Information System

MPMS

Multi-Modal Project Management System

NBIS

National Bridge Inspection Standards

Ordinary High Water

The line on the shore established by the fluctuations of water and indicated by physical characteristics such as clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas. In streams, these features are typically formed by erosion and/or deposition due to the presence of flowing water.

Right Edge

This is the right edge of the roadway as defined relative to the direction of traffic. See the sketches at the end of this section. This definition applies only for Minimum Lateral Clearance on Screen 4A. (This should not be confused with the “Right Side” of the bridge as defined under Direction of Orientation which is used for Sidewalk Type and Width on Screens VI and 5B).

Right Roadway

This is used to identify the roadway relative to the direction of inventory (increasing offset, stations, or milepoints). In the absence of offsets, stations or milepoints, the direction should be south to north, or west to east. Therefore, in the absence of offsets, stations or milepoints Northbound (NB) and Eastbound (EB) roadways are considered “Right Roadways”. Reference the sketch above adjacent to the definition for “Left Roadway.”

RMIS

Roadway Management Information System

RMS

Roadway Management System

Screen

The established arrangement of data items into fixed sets for viewing, updating, etc., by the user. Each set is viewed separately and individually on a CRT screen or via a paper print. Each set/screen has a 2 digit designation.

Sign Structure Orientation

The Near Side on one directional routes is the side facing traffic. The Near Side on two directional routes is the side facing traffic traveling in the direction of increasing segments, usually over the North Bound or East Bound lanes. The Right and Left Side are determined by facing the Near Side of the sign.

Structure

A bridge or facility constructed to support loads or facilities. (Example: an overhead sign support structure, retaining wall, etc.)

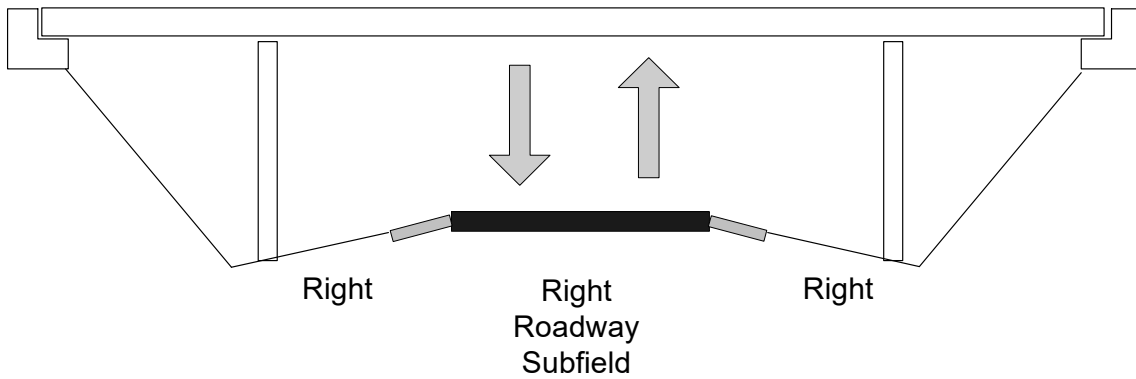
Structure Identification

A 14 digit code used to provide each structure in the system with a unique identification

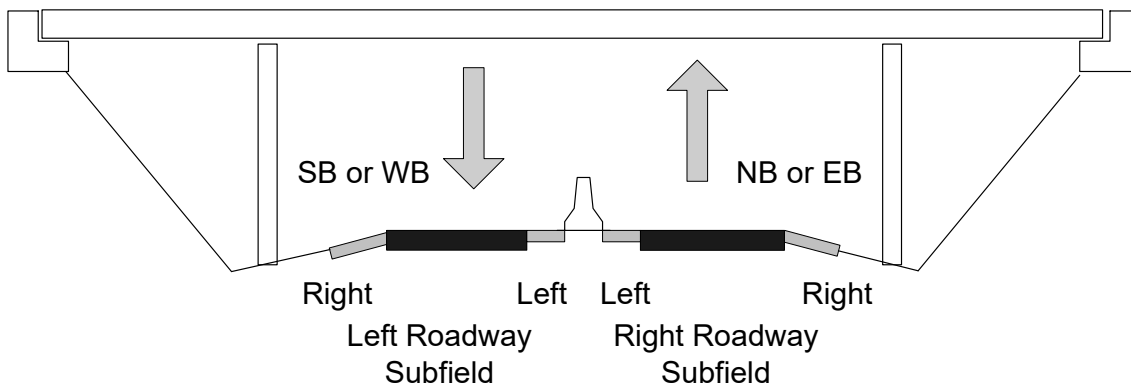
User

A user is a person who enters data, views existing data, and/or requests and obtains information (reports) from the system

Multi-Directional Highway
Undivided

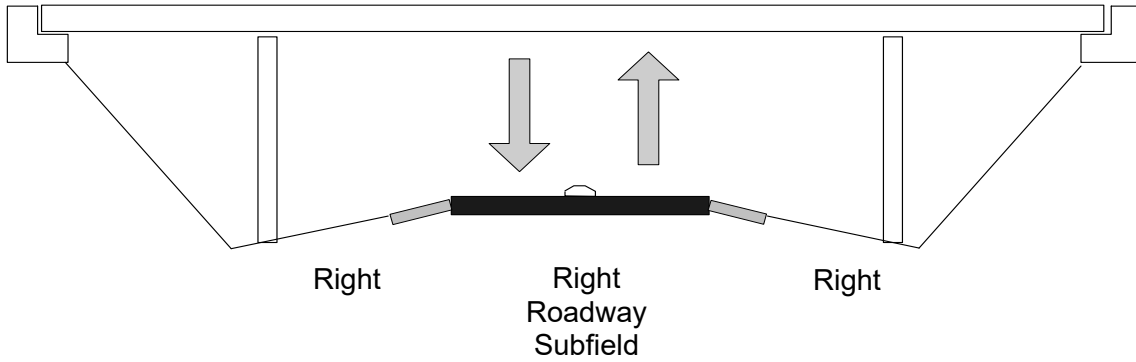


Multi-Directional Highways
Divided by an Obstruction



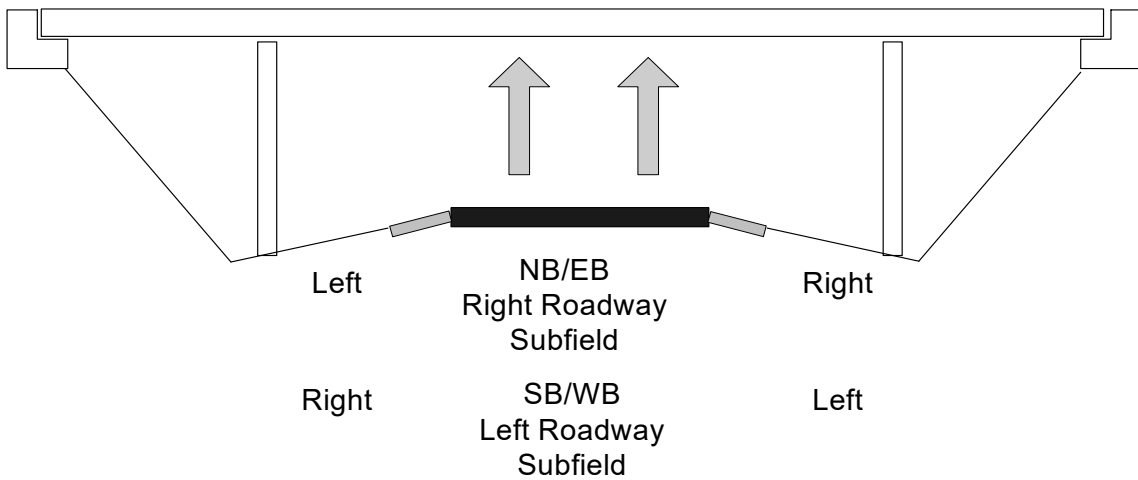
Obstructions may include:
Steel Box Beam, Steel W-Beam, and Concrete Shaped Median Barriers, Grass Medians, Non-Mountable Medians, and Substructure Units

Multi-Direction Highway with Mountable Median Barrier



Note: Mountable medians have a maximum edge height of 2" and are designed to be driven over if necessary.

One Way Traffic



1.0 INTRODUCTION

1.1 Background

The Bridge Management System 2 (BMS2) is the result of a three-phase project that replaced the original Bridge Management System (BMS). Developed by the Department in 1986, BMS served the Department well. However, limitations of the 1986 BMS made it impossible to go to the next level of modern bridge management needed to ensure the safe and efficient management of these critical assets. Three major business functions whose improvement was emphasized through BMS 2 included:

- Bridge planning – determining bridge needs on a network basis
- Bridge programming – selection of the correct work item for individual bridge
- Bridge maintenance management – better use of inspection data for determining maintenance needs and priority for planning and operations

Probably most importantly, the original BMS, based on NBI component-level condition data, could not provide planning analyses to accurately predict future deterioration and corrective bridge costs for various maintenance and improvement options. To provide the sufficiently-detailed and quantified condition data to the analysis models to support this critical planning function, the Department is adding the collection of AASHTO National Bridge Element data to the NBI component inspection data.

Once the planning module determines the overall bridge needs, the selection and programming of projects for improvement, preservation, and maintenance is critical to a successful bridge program. BMS2 will assist the Districts and bridge owners in programming the right work for the right projects to achieve the desired performance.

These planning and programming models in BMS will also support the bridge portion of the enterprise-wide Transportation Asset Management efforts. To that end, the BMS2 has greatly improved data sharing capabilities with other management PennDOT systems (e.g. RMS, MORIS/SAP, APRAS, ECMS, and GIS) to assist management decisions that transcend historical asset categories. The web-based portion of BMS2 allows local bridge owners direct access to the condition data for their bridges and also to a set of bridge management tools to assist their decision-making processes.

BMS2 is of critical importance as it allows PennDOT and local bridge owners to prioritize and perform more cost effective maintenance activities sooner, which will reduce or defer future replacements.

In addition, BMS2 has a more robust software program named “iForms” to support electronic data collection of bridge inspections for increased efficiency and effectiveness in the electronic collection of bridge data.

BMS2 is the database to store structure inventory, condition, and appraisal data required by the joint statutory and management needs of the Pennsylvania Department of Transportation and the Federal Highway Administration. The System stores, updates, and reports data on the physical and operating characteristics of all highway structures in Pennsylvania.

Prime system users are the individual District Bridge Units, the Asset Management Section of the Bureau of Maintenance and Operations and, eventually, local bridge owners. This System is designed to store data on every highway-related structure in Pennsylvania. Because the System was designed to accept a broad spectrum of structures, the number of data fields available is rather large. However, since there are fields not applicable to a given structure type, this has the effect of reducing the amount of data required at individual structures.

1.2 BMS2 Configuration

BMS2 is composed of two major components:

- a. BMS2 Web
- b. iForms

BMS2 Web is available to PennDOT personnel and external Business Partners who have requested access and been approved by the Department. It includes the following functionality:

- View and edit Bridge Inventory and Inspection information
- View and run BMS2 web reports posted by the Department
- View and store electronic documents stored in the Department's Electronic Document Management System (EDMS)
- View and edit Bridge Inventory and Inspection information
- View and edit Sign Structure, Wall and Other structure inventory and inspection information
- View and edit APRAS bridge data
- Create new structures in BMS2
- View BMS2 reports

iForms is available to all PennDOT personnel and Business Partners free of charge. All inspections must be entered and submitted through iForms. It includes the following functionality:

- Enter and store Bridge Inspection data
- Enter and store sign structure, walls and other structure inspection data
- Submit bridge inspection data to BMS2

1.3 Purpose of Manual

The objective of the BMS2 Coding Manual is to provide users guidance on coding inventory, inspection and appraisal data for PA structures. This manual provides limited instruction on how to navigate through the various BMS2 screens.

For descriptions of the elements used in BMS2 and instructions coding the inventory of National Bridge Elements on a bridge, refer to Appendices H, I, and J.

It is important that the user study the definitions and instructions contained in the User's Manual before attempting to input data into BMS2. All users should refer questions concerning the use of this System to the Asset Management Division, Bureau of Maintenance and Operations. The phone number is 717-787-6899.

1.4 Distribution Procedure

Hardcopy versions of the BMS2 Coding Manual (PennDOT Publication 100A) are no longer available from the sales store. PennDOT users who desire a hardcopy should request copies through Graphic Services. An updated digital copy of the manual will be maintained on the BMS2 website.

Each District will be responsible for establishing and maintaining a distribution list and for securing and distributing the Manual and its revisions within a District.

Recommendations for revisions should be transmitted by the District Bridge Engineer through the District Executive to the Director of the Bureau of Maintenance and Operations. Proposed changes should be specific and justified. Upon receiving the proposed modification, the Director of the Bureau of Maintenance and Operations will review it and transmit copies to the various Bureau Directors involved for comments. If acceptable, the change will be finalized, FHWA approval obtained if appropriate, and any system modifications implemented by the Bureau of Information Systems.

1.5 BMS2 Security Levels

1.5.1 BMS2 Security Levels

For BMS2, “security levels” or user roles are defined to help control access to the BMS2 functionality. These levels are described by their general business function. However, these security levels are not necessarily aligned with the work roles for corresponding users in a bridge unit. A user can be assigned to multiple security levels simultaneously – the user is given the total privileges for all assigned security levels. For example, although there is an “Inspector” security level defined, that level may be provided to a user that is not an inspector (e.g., an administrative support person) so that they can create and edit inspection data.

The BMS2 process roles, in order of increasing access, are as follows:

- **Browser** - The Browser is a “read-everything, change-nothing” kind of access. All of the modules may be accessed, but nothing in the database can be changed. Within BMS2, the security for the Browser role is enforced primarily by database level security constraints – it is not possible to disable many of the functions in BMS2 based on role. Therefore, a user with the Browser role may access buttons and other controls in BMS2. However, when the user attempts to use the buttons/functions they will receive a database error message indicating that they are not authorized to perform that function – the user will not have whose functionality will fail because he/she does not have the necessary permissions at the database level.
- **Inspector** - The Inspector role allows for reading all inspection and inventory data and using all of the Inventory and Inspection related functionality of BMS2. Inspector users can create and update inspections prior to supervisor review, but are prevented from updating approved inspections.
- **InspSuper** - The InspSuper (Inspection Supervisor) role builds on the Inspector role with additional abilities to delete and modify structures and to review and approve inspections. In particular, Inspection Supervisors have the privilege to approve inspections and modify data for inspections in “Accepted” status.
- **PowerUser*** - The PowerUser is very similar to the InspSuper with ability to delete and modify structures and to review and approve inspections as well as modify data for inspections in “Accepted” status. Additionally the PowerUser has the ability to delete certain inspections records for a structure. This is limited to the most recent inspection in BMS2 for a specific structure not in “Accepted” status.
- **SuperUser*** - The Super User role has full authority within BMS2 to perform any action. The SuperUser role provides access to the BMS2 Configuration screen to edit the BMS2 parameter tables, including the definition and modification of structure elements. All BMS2 functionality is available to the SuperUser.
- **AprasBrowser*** - The AprasBrowser is an add-on to Browser, Inspector, InspSuper and PowerUser. This add-on to a user’s profile allows the user to view Apras data that is available in BMS2.
- **AprasEdit*** - The AprasEdit is an add-on to the InspSuper and PowerUser roles. This add-on to a user’s profile allows the user to view and edit Apras data that is available in BMS2.

See section 2.2 BMS2 Security and Login for security for the different security level in BMS2 Web. Roles listed above with an asterisk (*) are limited to Department staff.

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2.0 BMS2

2.1. Introduction

The purpose of the BMS2 section is to provide a reference to each of the BMS2 for both internal PennDOT and external non-PennDOT users. This section contains screen images and short descriptions for accessing and using many of the features of the BMS2 screens. As such, this section does not address all of the functional areas of BMS2 outside of the BMS2 application.

2.2. BMS2 Security and Login

2.2.1 BMS2 Security for External Users

The BMS2 security requirements for external users (bridge owners, consultant inspectors, planning partners, etc.) are similar to the requirements for non-PennDOT Business Partners (BP) utilizing the Engineering and Construction Management System (ECMS). In addition, many local bridge owners and inspection consulting firms are already defined as ECMS BP. Therefore, the ECMS BP Registration subsystem is being used to manage external BMS2 users. The ECMS BP Registration functionality provides the following:

- By registering as a BP an organization is provided with a single BP Administrator userid. This administration userid is used to manage and maintain all BMS2 and ECMS userids for that organization's users.
- The BP Administrator user has access only to security and BP information. "Named" userids must be created to gain access to BMS2 and other ECMS Business Partner functions.
- BP Administrator users can Create, Modify, or Delete other users for their company, and reset passwords for their company's users. Therefore, PennDOT is not required to provide user administration support to non-PennDOT users.

Individual business partners, representing all possible external users including inspection consultants, local bridge owners and other organizations such as FHWA, will use ECMS BP Registration to set-up their users and associate security groups with each user corresponding to the roles they require within BMS2.

2.2.1.1 Business Partner Registration - Non-PennDOT BMS2 Users

Before establishing BMS2 users, non-PennDOT organizations (e.g., inspection consultants, other agency bridge owners, planning partners) must be registered as business partners using the BP Registration process provided by ECMS. Registered business partners receive an Administrative Userid and password that can then be used to create BMS2 users and/or assign BMS2 security groups to existing users.

Please note that non-PennDOT organizations using BMS2 must still be assigned to a structure or group of structures by an authorized PennDOT BMS2 user (or another business partner organization defined as an owner) before users for that business partner they will be able to view or maintain structure information in BMS2. For more information about the assignment process, please reference Section 2.8 Assigning Business Partners.

To register as an ECMS/BMS2 BP:

1. Navigate to the ECMS website at <https://www.ecms.penndot.gov/ECMS/>
2. Under links, click on Register as a PennDOT Business Partner
3. Follow the instructions on the BP Registration screen in ECMS.

Once a business partner is registered and established within ECMS, the provided Administrative Userid can then be used to create new BMS2 users or add BMS2 security groups to existing users.

2.2.2 BMS2 Security for PennDOT Users

ECMS user security has been incorporated into the PennDOT J2EE PDFramework that is utilized as the basis for the development of BMS2. The security components provided as part of the PDFramework provide the means to verify that a user is authorized to access an application (in this case BMS2) and determine the security groups to

which a user has been assigned, which in turn are then used to provide or limit access to particular BMS2 screens and functions. Therefore, in addition to the use of the ECMS Business Partner Registration functionality for external users, ECMS Security Administration will also be used to setup and maintain PennDOT BMS2 users. All PennDOT users of BMS2 must have an assigned ECMS userid and password that is distinct from the PENNDOT domain userid (CWOPA) and password utilized for security within BMS2 Web. Security administration for PennDOT users of BMS2 will be provided via the ECMS Help Desk. After successfully obtaining ECMS access, BMS2 access can be obtained by filling out the User Authorization Request Form on the BMS2 log-in screen or available directly here:

<http://dot.state.pa.us/pdf/ecms/REQUEST%20FOR%20ECMS%20USERID%20district.pdf>.

2.2.2.1 Business Partner Registration - PennDOT BMS2 Users

PennDOT BMS2 users must have an ECMS userid and password to log into BMS2. This is because the ECMS Security Administration functionality is being used as the tool for administering BSM2 Web security. If a BMS2 user does not yet have an ECMS userid, they must apply for one with the PennDOT Engineering Computing Management Division (ECMD).

2.2.3 BMS2 Security Levels

Within the BMS2 application, the “security levels” or user roles are defined to help control access to structure inventory and inspection information. These security levels are described by their general business function but are not necessarily aligned with the corresponding work roles for a user. A BMS2 user can be assigned to multiple security levels simultaneously – the user is given the total privileges for all assigned security levels.

In general, the BMS2 security roles can be described as follows:

- Browser – The Browser is a “read-everything, change-nothing” kind of access. All of the modules may be accessed, but nothing in the database can be changed.
- Inspector – The Inspector role allows for reading all inspection and inventory data and using all of the Inventory and Inspection related functionality of BMS2. Within BMS2, users with Inspector authority can access all inventory- and inspection-related screens and have edit access to inventory data and to inspection data for any inspection that is not in Accepted (approved) status.
- Inspector Supervisor - The Inspector Supervisor role builds on the Inspector role with additional abilities to review and approve inspections. In particular, Inspection Supervisors have the privilege to approve inspections and modify data for inspections in “Approved” status. Within BMS2, users with Inspector Supervisor authority have the ability to edit all inspection data available in BMS2, regardless of the corresponding inspection status.
- Owner – This role has full authority within BMS2 to perform any action.

2.2.4 BMS2 Security Groups

The following is a list of the specific security groups available for PennDOT and Business Partner users within BMS2. These security groups must be linked to a BMS2 user by an authorized PennDOT or Business Partner Security Administrator using the ECMS Security Administration functionality. In general, external Business Partners have user roles that parallel and are generally equivalent to PennDOT user roles.

- Consultant
 - ADMIN
 - BROWSER
 - BROWSER INVENTORY
 - BROWSER INSPECTION
 - CONSULTANT INSPECTOR
 - CONSULTANT INSPECTOR SUPERVISOR
 - CONSULTANT OWNER AGENT
- Municipality
 - ADMIN
 - BROWSER
 - BROWSER INVENTORY
 - BROWSER INSPECTION
 - MUNICIPALITY INSPECTOR
 - MUNICIPALITY INSPECTOR SUPERVISOR
 - MUNICIPALITY OWNER AGENT
 - MUNICIPALITY STRUCTURE OWNER
- Planning Partners
 - ADMIN
 - BROWSER INVENTORY
- FHWA
 - ADMIN
 - BROWSER
 - BROWSER INVENTORY
 - BROWSER INSPECTION
- Agency Bridge Owner
 - ADMIN
 - BROWSER
 - BROWSER INVENTORY
 - BROWSER INSPECTION
 - AGENCY INSPECTOR
 - AGENCY INSPECTOR SUPERVISOR
 - AGENCY OWNER AGENT
 - AGENCY STRUCTURE OWNER

2.2.5 BMS2 Business Partner Assignment

One of the key requirements for BMS2 is that external users have access to BMS2 for viewing and maintaining structure-related data. However, external users are only to be given access to data for the structures to which they have been specifically assigned access. For example, consulting firms performing bridge inspections require access to BMS2 for submitting and maintaining inspection data for structures they are assigned to inspect (e.g., upload and download *iForms* inspection data, create and edit manual inspection data). PennDOT users have access to all structures in BMS2 and therefore do not have to be assigned access to specific structures.

To facilitate the assignment process for external users, BMS2 provides screens and components for Business Partner Assignment as described in Section 2.8. In general, an external user can be assigned access to a particular structure or set of structures using one of the following assignment types:

- Owner – An Owner has full access to edit and maintain all structure-related data provided via BMS2. In addition, an Owner has the ability to assign or revoke the assignment of other business partners for their structures, including the ability to designate an Owner Agent. An Owner cannot prohibit PennDOT access to structure data.
- Owner Agent – An Owner Agent is an external business partner that can act on behalf of an Owner for a structure. Owner Agents have the same level of access to structure data as the corresponding owner, including the ability to assign or revoke the assignment of other business partners for a structure. An Owner Agent cannot prohibit PennDOT access to structure data.
- Inspector – An Inspector Business Partner is allowed to create and maintain inspections for a structure and view inventory data.
- Planning Partner – A Planning Partner can view inventory data for a particular structure but cannot edit data. In addition, a planning partner is restricted from editing and viewing inspection data.

In all cases, a particular structure can have multiple business partners assigned with the same assignment type simultaneously. For example, multiple consultant business partners can be assigned as Inspectors at the same time, supporting the turnover of inspection responsibility from one business partner to another or providing access to a “regular” inspection firm and an underwater inspection firm.

These assignment types only provide access to structure data for a particular organization – users within that organization must still be assigned the necessary security groups to access the corresponding functionality. For example, a Browser user for a consultant business partner that has been defined as an Inspector for a structure can still only view inspection data for that structure – they must be assigned the Inspector or Inspector Supervisor security group to maintain and/or submit inspection data.

Structure assignments are automatically incorporated into BMS2 – there is no additional action that an external user must take to gain access nor are separate screens provided. The selection criteria on the BMS2 Structure Search screen automatically includes the assignment criteria in addition to any selection criteria entered by the user. If an external user enters no selection criteria on the Structure Search screen and clicks the Search button, the list of all structures to which the user’s organization is assigned is displayed.

2.2.6 BMS2 Application Login

To sign on to the BMS2 system, external users will navigate to the following web address:

<https://www.bms.penndot.gov/BMS2Web/>

This address supports PennDOT internal users and external users (e.g., local bridge owners, planning partners and consultants) To improve performance, PennDOT users attached to the PennDOT network will also have access to the BMS2 application at the following internal web address:

<https://www.bmsint.penndot.gov/BMS2Web/>

Figure 2.2.6-1 BMS2 Login Screen

To login to BMS2:

1. Access the BMS2 application using either the internal or external address, <https://www.bms.penndot.gov/BMS2Web/> (external) or <https://www.bmsint.penndot.gov/BMS2Web/> (internal)
2. Enter your assigned User ID and the corresponding password in the appropriate fields and click the 'Login' button.
3. Accept confidentiality statement in order to enter into BMS2.
4. The Structure Search screen is displayed.

2.2.7 BMS2 Access to Risk Score

Only authorized Department users will be able to see screen fields or access data for Risk Score through BMS2. As such, Business Partners will not be able to see any of the Risk Score screen fields. Also, generation of risk score reports is limited to Department users with access to Crystal reports and login security access to BMS2. Risk score information for local owners can be obtained by request through the Bridge Asset Management Section Chief. Responses will be provided to the respective District Bridge Engineer.

2.2.8 Structure Plan Number

An automated S-Number Generator, Structural Plan Number Generator (SPNG), which is housed within the Bridge Management System 2 (BMS2), is to be used by consultant or District personnel to provide a computerized method of securing and recording Structure Plan Number (S-Number).

The SPNG is only available to BMS2 users with specific access to the generator, similar to the restricted access for APRAS. The generator appears on the landing page after successfully logging into BMS2.

Refer to additional guidance in Publication 15M (DM-4).

2.3. System Basics

This section provides information about some of the general characteristics of the BMS2 application. It describes how a user will navigate through various screens.

2.3.1 Things You Can't Do In BMS2

While providing increased flexibility for accessing and maintaining BMS2 data for both internal and external users, there are also some limitations as to what functions can be performed in BMS2 in comparison to other components of BMS2. The following functions cannot be performed directly in BMS2:

- **Create Inspections** – Users must use the *iForms* application to create a new inspection for completion and submission into BMS2.

2.3.2 Field Label Prefixes

These four character prefixes appear in front of the textual field label on each screen. The format of the field labels are XXNN. The first two characters (XX) correspond to the BMS2 screen-specific Label Prefix (see table below), while the third and fourth characters (NN) provide a two-digit sequence number (with a leading zero for single digits). The numbers are sequenced by the field position on the screen, within group boxes, left to right, top to bottom.

Table 2.3.2-1 is a high-level cross reference of Web Links screens to BMS2 screens and corresponding label prefixes:

Web Links	BMS2 Screens
Structure Home	2A - Inspection Notes 5A - Inspection Inventory - ID/Admin 5B - Inspection Inventory - Design 5E - Inspection Inventory - Classification VM - Inventory - Maintenance Responsibility
Agency Bridge	6A - Agency Bridge
Features (and associated Detail screens)	4A - Inspection Appraisal Card - Other Ratings 5C - Inspection Inventory - Roads 6C - Agency Roadway FW - Feature Intersected - Waterway FR - Feature Intersected - Railroad FT - Feature Intersected - Utility
Structure Units (and associated Detail screens)	5B - Inspection Inventory - Design 5D - Inspection Inventory - Structure Units SP - APRAS Span - Span
Drawing Notes (and associated Detail screens)	VN - Inventory - Drawing and Notes
Posting (and associated Detail screens)	VP - Inventory - Posting
Inspection Planning (and associated Detail screens)	VI - Inventory - Inspection Planning
Paint (and associated Detail screens)	VA - Inventory - Paint
Design (and associated Detail screens)	VD - Inventory - Design
Inventory - Signs and Lights	2A - Inspection Notes 5A - Inspection Inventory - ID/Admin 6A - Agency Bridge 6C - Agency Roadway VS - Inventory - Signs and Lights

Inventory – Walls	2A - Inspection Notes 5A - Inspection Inventory – ID/Admin 6A - Agency Bridge VW - Inventory – Walls
Inventory – Tunnel	I (VT) - Identification S (VT) - Structure Type and Material N (VT) - Navigation A (VT) - Age and Service C (VT) - Classification
Structure Group	SG - Structure Group
Risk Score Detail	5A - Inspection Inventory – ID/Admin 6A - Agency Bridge
Ratings and Schedule	1A - Inspection Condition 4A - Inspection Appraisal - Other Ratings 7A - Inspection Schedule IC - Inspection – Comments
Agency Inspection	1A - Inspection Condition 6B - Agency Inspection IC - Inspection – Comments
Notes & Comments (and associated Detail screens)	1A - Inspection Condition 2A - Inspection Notes IC - Inspection – Comments
Element Condition (and associated Detail screens)	1A - Inspection Condition 1B - Create / Edit Element
Fracture Critical (and associated Detail screens)	6A - Agency Bridge 7A - Inspection Schedule IF - Inspection - Fracture Critical
Signing (and associated Detail screens)	ID - Inspection – Signing Details
Safety Features (and Detail screens)	IA - Inspection – Safety Features
Load Rating List (and associated Detail screens)	4B - Inspection Appraisal - Load Ratings IR - Inspection - Load Rating L (IT) - Inspection – Load Rating - Tunnels
Underwater (and associated Detail screens)	1A - Inspection Condition 7A - Inspection Schedule 4A - Inspection Appraisal – Other Ratings IU - Inspection - Underwater / OSA IN - Inspection - Underwater / Sub Units IL - Inspection - Underwater / Other
Inspection – Signs and Lights	7A - Inspection Schedule IS - Inspection - Signs
Inspection – Walls	6A - Agency Bridge IW - Inspection – Walls
Proposed Maintenance (and associated Detail screens)	3A - Inspection Work 3B - NBI Project Data IM - Inspection – Maintenance
Completed Maintenance (and associated Detail screens)	3A - Inspection Work IM - Inspection – Maintenance

APRAS Data	5C - Inspection Inventory - Roads SP - APRAS Span - Span SS - APRAS Span - Apras Span SL - APRAS Span - Load Capacity SC - APRAS Span - Clearance
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Table 2.3.2-1 Web Links vs. BMS2 Screens

2.3.3 Common Functions and Navigation

BMS2 screens include a common header and footer that are consistent across most screens. The common header and footer is not a separate screen but a set of common fields/functions that allow the user to quickly navigate between different screens and different structures within BMS2.






Figure 2.3.3-1 BMS2 Navigation Header

When the user is viewing a screen and modifies data on the screen and the Save button is not pressed before using one of the common navigation links/buttons described below, the modified data is lost. Users are not automatically prompted to save changes before leaving a screen.

2.3.3.1 Header and Footer Links

The common header and footer contain several static links that allow the user to navigate to other systems outside of BMS2 and/or to return to the BMS2 login screen. Specifically, the following static links are included in the header and footer for each BMS2 screen:

- Common Header Links
 -  - Takes user to the Commonwealth of Pennsylvania web page (www.pa.gov).
 -  - Takes user to the external PennDOT homepage (www.penndot.gov).
 -  - Takes user to the BMS2 login screen (<https://www.bms.penndot.gov/BMS2Web/>).
 - Logout - Returns users to the BMS2 login screen.
- Common Footer Links
 - PennDOT - Takes user to the external PennDOT home page (www.penndot.gov).
 - Pennsylvania - Takes user to the Commonwealth of Pennsylvania web page (www.pa.gov).
 - PennDOT Privacy Policy - Takes user to the Commonwealth of Pennsylvania Privacy Policy and Disclaimers web page (<http://www.pa.gov/privacy-policy>).
 - Release Notes - Takes the user to a web page that displays the updates made to BMS2 and/or iForms sorted release date.

2.3.3.2 Common Header Go Buttons

The common header contains enterable fields for Structure ID (SR ID), BRKEY, and Agency ID, as well as a Go To dropdown list. The BRKEY is the unique identifier of a structure in BMS2. Structure ID is the 14-character numeric identifier for a structure, which may not be unique in some cases. For state-owned bridges, the Structure ID consists of the two-digit PA County, the four-character State Route ID, the four-character Segment and the four character Offset. The Agency ID is a new field that allows local and agency owners to uniquely identify a structure using their own identifier. The Go To field contains a pre-defined list of BMS2 screens to which the user can navigate to or from the current screen.



Figure 2.3.3.2-1 Header “Go” Buttons

When a BMS2 screen is first displayed, the BRKEY, Structure ID, and Agency ID fields display values for the currently displayed structure. However, these fields also give users the ability to change one of these key fields, press the “Go” button associated with the field and navigate to the screen that is selected in the Go To field. The Go To field defaults to the current screen, so by default the user will go to the same screen for the newly specified structure key. If the user wants to navigate to a different screen, the user may change the selection in the Go To field before clicking the Go button. These navigation fields are not linked – the user is only required to change one field and click the corresponding Go button to access the new structure/screen.

Note: When utilizing the Common Header Go buttons from a BMS2 Detail screen (e.g., a selected item from the Features Intersected List screen), screen control is transferred to the corresponding parent list screen for the new structure key. This is because a particular detail record may not exist for the new structure to be displayed, and proceeding to the parent list screen helps to avoid a “record not found” condition.

2.3.3.3 Quick Links

On most BMS2 screens the common header includes static links to every other BMS2 screen. These “Quick Links” are provided to allow the user to open another screen for the same structure that is currently being viewed. When the user clicks a link to navigate to another Inventory screen, the user remains in that structure. When navigating to an Inspection screen for the first time for that structure the most recent inspection for that structure is displayed by default. However, if the user opens a prior inspection by changing the selected Inspection Date and then clicks the quick link for another Inspection screen, the selected Inspection Date remains as the inspection date for the new screen (i.e., the user continues to view data for the selected inspection). However, when the user selects a different inspection, navigates to an Inventory screen and then clicks a quick link for an Inspection screen, the inspection date is again defaulted to the most recent inspection information.

These static Quick Links operate independently from the key fields associated with the Common Header Go buttons. When using the static links the user cannot enter a different structure key value to access.

The Quick Links are grouped into three sections:

- Inventory Screen Links – Links to other Inventory-related screens for the current structure.
- Inspection Screen Links – Links to other Inspection-related screens for the current structure. As noted above, when linking from one inspection screen to another the currently-displayed inspection date remains selected. However, when linking to an inventory screen the selected inspection date (if not the current inspection) is “lost” so that when the user selects another subsequent inspection screen the date is defaulted back to the current inspection.
- Other Links – Includes links to other screens that are not specific to inventory or inspection data, including Search Structures, APRAS Data, EDMS Documents and Business Partner (BP) Assignments (used to assign Business Partners with access to specific structures).

The common header includes a Hide Quick Links option that closes the Quick Links portion of the screen to allow for more room for data to be displayed. When the Quick Links section is hidden a Show Quick Links option is made available to re-open the Quick Links section.

2.3.3.4 Common Screen Buttons

Buttons for screen functions are always displayed in a “button row” in the common header immediately below the system title area. This button row remains displayed regardless of whether the user scrolls to another area of the screen. Some common buttons that are displayed on most of the BMS2 screens include the following:

- Back - Returns the user to the previous screen. When using the Next and Previous buttons to scroll within the detail records for a particular list of items (e.g., roadway features, load ratings, etc.), the Back button returns the user to the prior list screen and not the next or previous detail record.
- Next and Previous - “Scrolling” buttons that take the user to the next or previous detail record within a list of items. Next and Previous buttons are only displayed on certain Detail screens.
- Save - (Edit mode only) When displayed for an authorized user, saves changes made on the current screen to the BMS2 database.
- Save & Exit - (Edit mode only) When displayed for an authorized user, saves changes made on the current screen to the BMS2 database and then returns the user to the previous screen. This button provides a short-cut to pressing the Save button and then pressing the Back button.
- Print - Opens the current screen in a printer-formatted window that can then be printed using the normal browser Print function.
- Help - This will open a screen in the future with a detailed guide on the use of BMS2.

2.3.3.5 Required Entry Fields

There are few required fields within BMS2. All required fields are distinguished with a yellow field background and a yellow flag icon displayed to the right of the entry field itself:

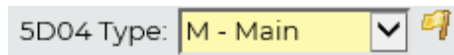


Figure 2.3.3.5-1 A Required Entry Field

2.3.4 Structure Search

Upon login the BMS2 application first displays the Structure Search screen. The Structure Search screen provides the primary method for listing and selecting a structure in BMS2. Using the Go To functionality in the common header is another.

2.3.4-1 Structure Search Screen

To use the Structure Search to list one or more structures the user performs the following steps:

1. Enter or select search criteria in at least one field.
2. Click the Search button in the header. A list of all structures available to the user that meet the entered search criteria is then displayed on the Structure List screen.
3. Click on the Clear button to clear the search fields.

2.3.4.1 Saved Searches

If you have a frequently requested search (e.g., District, Turnpike bridges in your District, a high profile bridge, etc.), use the Saved Searches functionality to retain the search criteria for future use.

1. Complete the relevant fields in the Specify Search Criteria section as for a “normal” search.
2. Type a name for the search in the “Save Search as” field in the bottom right.
3. Click the Save button.
4. The search criteria is saved under the specified name in the Saved Searches dropdown list.

To invoke a saved search:

5. Select the desired search name from the dropdown list.
6. Click the Execute button. The user is taken to the Structure List to display the results for the selected saved search.
7. To refine the search criteria, highlight the Saved Search from the drop down list and click the Load button. The criteria used in the selected named search is used to populate the Search criteria fields. The criteria can then be modified for a single search or modified and saved to overlay the existing saved search.

To delete a saved search, select the search name in the Saved Search dropdown list and click the Delete button.

2.3.5 Structure List

BMS2 users access the Structure List screen by executing an adhoc or Saved Search on the Structure Search screen. The Structure List displays the list of all structures available to the user that meet the specified search criteria.

For non-PennDOT users, the list of structures displayed on the Structure List screen only includes those structures to which the user’s organization is assigned that meet the search criteria. For example, if a consultant user specifies Adams county (01) as the search criteria and the consultant Business Partner is only assigned as the Inspector for one structure in Adams county, only that one structure is displayed on the Structure List even though there is more than one structure in Adams county.

STRUCTURE LIST							
Filter	SR ID		Go				
Records 1 to 25 of 5000			<< < 1 2 3 4 5 6 7 8 9 10 ... 200 >>			Records Per Page: 25	
BRKEY	SR ID	Structure Name	Structure Type	Service Type	Structure Length (ft)	Feature Intersected	Last Inspection
47147	01001500101955	VMS CENTERMOUNT	19939	S1	0	US 15 South	06/15/2012
2	01001500300000	1.25M N. MARYLAND LINE	42204	15	103	MIDDLE CREEK	09/26/2016
3	01001500310000	1.25 MI. N. OF MD LINE	42206	15	101	MIDDLE CREEK	09/26/2016
4	01001500500000	2 MI N OF MARYLAND LINE	42406	15	149	MARSH CREEK	12/01/2016
5	01001500510000	2 MI. N. OF MARYLAND LINE	42204	15	150	MARSH CREEK	12/01/2016
6	01001500700986	3.5 MI. N. MARYLAND LINE	21931	15	16	TRIB MARSH CREEK	01/17/2017
7	01001501001849	S OF GETTYSBURG	21932	15	22	PLUM RUN	12/19/2016
9	01001501302809	2.5 MI S OF GETTYSBURG	31931	15	11	TRIB TO ROCK CREEK	02/21/2017
11	01001501312846	2.5 MI.S. OF GETTYSBURG	21932	15	11	TRIB ROCK CREEK	03/13/2015
12	01001501500000	SOUTH OF GETTYSBURG	42206	15	156	ROCK CREEK	02/22/2017
13	01001501510000	S OF GETTYSBURG	42204	15	154	ROCK CREEK	01/18/2017
14	01001501900000	US15 & PA 116 INTERCHANGE	42206	11	43	PA 116; SR 0116	01/19/2017
15	01001501910000	2 MI. E. OF GETTYSBURG	42206	11	43	PA 116; SR 0116	01/19/2017
16	01001502100000	2 MILES S.GETTYSBURG	31931	15	12	BRANCH OF ROCK CREEK	04/17/2015
17	01001502110000	2 MI. S. OF GETTYSBURG	21931	15	14	TRIB TO ROCK CREEK	04/17/2015
18	01001502300000	US15NB Over RR	42204	12	92	CSX	05/22/2017
19	01001502310000	2 MI. N.E. GETTYSBURG	42207	12	88	CSX	05/22/2017
20	01001502403671	NE OF GETTYSBURG	21932	15	23	BRANCH ROCK CREEK	04/19/2017
21	01001502503319	1 1/2 MI. S. HUNTERSTOWN	21932	15	16	TRIB ROCK CREEK	04/23/2015
23	01001503101310	2 MI. N. OF PA 394	21931	15	16	TRIB CONEWAGO CREEK	06/05/2015
24	01001503300975	S OF HEIDERSBURG	42206	15	167	CONEWAGO CREEK	06/26/2017
25	01001503311440	2 MI. S. OF HEIDERSBURG	42206	15	167	CONEWAGO CREEK	06/26/2017
26	01001503401799	1.5 MI.S. OF HEIDERSBURG	21931	15	11	TRIB CONEWAGO CREEK	06/12/2015
27	01001503900985	2 MI N OF HEIDERSBURG	42206	15	104	BERMUDIAN CREEK	06/26/2017
28	01001503911269	N OF HEIDERSBURG	42206	15	109	BERMUDIAN CREEK	06/26/2017

Figure 2.3.5-1 Structure List

To access the Structure Home page from the Structure List screen:

1. Click on the BRKEY or SR ID number links in the first or second column for the structure to be accessed.
2. User is taken to the Structure Home screen for that structure.

The Structure List screen includes a number of functions that allow the user to customize the displayed list:

- Column Sort - The column headings for each column are active links that allow the user to sort the displayed list by the corresponding column values. Simply click the column header link to sort the list; click the link again to sort in ascending or descending order.
- Number of Records per Page - The user can adjust the number of records displayed on each page by changing the selected value in the Records Per Page dropdown.
- Jump to a Particular Page - In the header and footer bands for the Structure List itself the screen displays links corresponding to the total number of pages for the list. Click any of the specific page numbers to jump directly to that page.
- Filter - To filter the displayed list beyond the criteria specified on the Structure Search screen, select Filter in the first dropdown below the screen title, select the column to be used as the Filter in the second dropdown, and enter the Filter criteria in the field provided. Note that for a filter the entered field value must be an exact match - partial filter values are not supported. Click the Reset button to return to the full list.
- Search - To search the structure list for a particular field value, select Search in the first dropdown below the screen title, select the column to be used for the search, and enter the search text in the field provided. This search function takes the user to the first Structure List page on which the search string is found (it does not scroll to the exact record).

2.4 Inventory Screens

2.4.1 Structure Home

The Structure Home screen serves as the “home page” for a structure. The Structure Home screen is the first screen accessed using the BRKEY link on the Structure List screen. In addition to providing links to all of the inventory and inspection screens and data for a structure, this screen is also used to view and maintain the NBI structure inventory information.

This screen presents structure inventory information from the ID/Admin, Design and Classification fields. This screen also displays the structure-level Notes field.

This screen can be accessed in Edit mode by authorized users. Changes to data on this screen are saved to the production BMS2 database.

The screenshot displays the 'INVENTORY - STRUCTURE HOME' interface. At the top, there are search fields for '5A01 SR ID', '5A03 BRKEY', and 'Agency ID', each with a 'GO' button. A 'Go To' dropdown menu is set to 'Inventory - Structure Home'. Below this is a navigation bar with three main sections: 'Inventory Links', 'Inspection Links', and 'Other Links'. The 'Inventory Links' section includes links for Structure Home, Agency Bridge, Features, Structure Units, Drawing Notes, and Structure Group. The 'Inspection Links' section includes Ratings & Schedule, Agency Inspection, Notes & Comments, Element Condition, and Fracture Critical. The 'Other Links' section includes Search Structures, Last Search Results, EDMIS Documents, Proposed Maintenance, Completed Maintenance, BP Assignment, Reports, Bulletin Board, Validations (with counts), Risk Assessment Search, Last Risk Assessment Search Results, and APRAS Data. The main content area is divided into three sections: 'Structure Identification' with fields for 5A01 Structure ID, 5A02 Name, and 5A03 NBI Structure No.; 'Location' with fields for 5A04 District, 5A05 County, 5A06 City/Town/Place, 5A07 Feature Intersected, 5A08 Facility Carried, 5A09 Location, 5A10 Latitude, 5A11 Longitude, 5A12 Bord St, 5A12 FHWA Reg, Share, 5A13 Border Struct No, 5A14 FIPS State, and 5A14 FIPS Region; and 'Age and Service' with fields for 5A15 Year Built, 5A16 Year Reconstruct, 5A17 Type of Service On, 5A18 Under, and 5A19 Num Lanes Under. A 'Management' bar is at the bottom.

Figure 2.4.1-1 Structure Home Screen

2.4.2 Agency Bridge

The Agency Bridge screen is used to view and maintain structure inventory information from the Agency / Bridge fields. These fields are PennDOT-specific inventory fields.

This screen can be accessed in Edit mode by authorized users. Changes to data on this screen are saved to the production BMS2 database.

The screenshot displays the 'INVENTORY - AGENCY BRIDGE' web application interface. At the top, there are search fields for '5A01 SR ID', '5A03 BRKEY', and 'Agency ID', each with a 'GO' button. A 'Go To' dropdown menu is set to 'Inventory - Agency Bridge'. Below the search area are three columns of navigation links: 'Inventory Links', 'Inspection Links', and 'Other Links'. The main content area is divided into three sections: 'General', 'Structure Type', and 'Deck Wearing Surface Info'. The 'General' section contains fields for Agency ID, Senat Dist (6A01), Cong Dist (6A02), Leg Dist (6A03), Bndy (6A04), Util Present (6A05), Sub Agency (6A06), Fed Fund (6A07), and various checkboxes for Critical Facility (6A09), Flood Insp (6A10), Covered Bridge (6A11), Dem/Repl Ind (6A12), Hist Dist Cont (6A14), Preserv Candidate (6A16), Future Bridge Bill (6A17), Network (6A18), Bus Plan Ntk (6A19), Watershed (6A20), De-Ice Equip (6A21), Corridor (6A22), Owner Decs (6A23), Trnback Desc (6A24), and Contextual Preservation (6A58). The 'Structure Type' section includes dropdowns for Material (6A26), Physical (6A27), Span Interact (6A28), and Struct Config (6A29), along with an 'Approach' dropdown. The 'Deck Wearing Surface Info' section includes dropdowns for Surf (5B02/6A30), Memb (5B03/6A31), and Protect (5B04/6A32), and input fields for Thickness (6A33), Dt Recorded (6A34), Surf Thick (6A35), Protect Year (6A36), and Protect Note (6A37).

Figure 2.4.2-1 Agency Bridge Screen

2.4.3 Features Intersected

2.4.3.1 Features Intersected List

The Features Intersected List screen lists all of the intersecting features – roadways, waterways, railroads and utilities – for a specific structure. The Features Intersected screen only displays non-roadway features, as this screen combines the display of roadway and non-roadway features in a single list.

Each list section on this screen displays data characteristic of the corresponding feature type. Feature data cannot be directly edited on this screen – the user must select one of the displayed features and proceed to a corresponding Detail screen to edit data (assuming the user has the necessary security authorization).

In edit mode, the header for each feature list contains a Create link. Clicking on the link allows users to create a new feature of the corresponding type (roadway, waterway, etc.) Each feature in the list also has two links, Edit and Remove, which allow users to view and edit the feature detail data or remove the feature, respectively.

In view mode, each includes a single View link to access the corresponding Detail screen.

INVENTORY - FEATURES INTERSECTED Hide Quick Links

SA01 SR ID:

SA03 BRKEY:

Agency ID:

Go To: Inventory - Features Intersected

Inventory Links

- Structure Home
- Agency Bridge
- Features
- Structure Units
- Drawing Notes
- Structure Group

Posting

- Posting
- Inspection Planning
- Paint
- Design
- Risk Assessment Detail

Inspection Links

- Ratings & Schedule
- Agency Inspection
- Notes & Comments
- Element Condition
- Fracture Critical

Signing Details

- Safety Features
- Load Ratings
- Underwater

Other Links

- Search Structures
- Last Search Results
- EDMS Documents
- Proposed Maintenance
- Completed Maintenance
- BP Assignment

Reports

- Bulletin Board
- Validations: 0 0 0 0
- Risk Assessment Search
- Last Risk Assessment Search Results
- APRAS Data

Minimum Vertical Clearance

4A15 Over Structure Clearance:

4A16 Under (Reference):

4A17 Under Clearance:

Minimum Lateral Clearance

4A18 Reference Feature: [blank]

4A19 Right Side: ft

4A20 Left Side: ft

Roadway

5C01 Route Name	RMS key	5C03 On_Under	5C04/5C06 Rte Pref/Route#/Suf	6C01-6C04 State Route	5C10 ADT	5C22 Functional Class	Action
		1 - Route On Structure	1/00000/1	-1_ -1	20	17 - Urban Collector	View Edit
		C - 3rd Route Under	1/1		100	01 - Rural Interstate	View Edit
		E - 5th Route Under	5/00000/0		40	09 - Rural Local	View Edit
		Z - 26th Route Under	2/123/1		0	09 - Rural Local	View Edit

Waterway

FW01 Stream Name	5C03 On/Under	Action
Stream	B - 2nd Route Under	View Edit
Stream	D - 4th Route Under	View Edit

Railroad

FR01 Railroad Name	5C03 On/Under	FR03 Service Status	Action
	A - 1st Route Under	1 - In Service	View Edit

Utility

FT01 Utility Name	FT02 Utility Type	FT03 License Number	Action
	W - Water	XXXXX	View Edit

Figure 2.4.3.1-1 Features Intersected List

2.4.3.2 Roadway Detail

The Roadway Detail screen allows users to view and maintain detail information about a specific roadway associated with a structure. This screen can be accessed in Edit mode by authorized users. Changes to data on this screen are saved to the production BMS2 database.

In addition to the standard Back, Save and Save & Exit buttons, this screen also provides a Delete button to remove the currently-displayed roadway, a New button to create a new roadway, and Previous and Next buttons that allow the user to display the next or previous roadway item in the list.

INVENTORY - FEATURES INTERSECTED				Hide Quick Links
5A01 SR ID: <input type="text"/>	5A03 BRKEY: <input type="text"/>	Agency ID: <input type="text"/>	Go To: Inventory - Features Intersected	
Inventory Links Structure Home Agency Bridge Features Structure Units Drawing Notes Structure Group		Inspection Links Ratings & Schedule Agency Inspection Notes & Comments Element Condition Fracture Critical		Other Links Search Structures Last Search Results EDMS Documents Proposed Maintenance Completed Maintenance BP Assignment
Posting Inspection Planning Paint Design Risk Assessment Detail		Signing Details Safety Features Load Ratings Underwater		Reports Bulletin Board Validations: 0 40 0 70 Risk Assessment Search Last Risk Assessment Search Results APRAS Data
Roadway Identification		Traffic		
5C01 Route Name: <input type="text"/>	5C03 On/Under: 1 - Route On Structure	5C08 Lanes: <input type="text"/>	Medians: <input type="text"/>	Speed: <input type="text"/> mph
5C04 Kind HWY(Rt. Pref): 1 - Interstate Hwy	5C05 Desig. Lvl Service: 1 - Mainline	5C09 ADT Class: (blank)	5C10 Recent ADT: <input type="text"/>	5C11 Year: <input type="text"/>
5C06 Rte #/suffix: 00000 1 - North		5C12 Future ADT: <input type="text"/>	5C14 Truck % ADT: <input type="text"/>	5C13 Year: <input type="text"/>
		5C15 Detour Length: <input type="text"/> mi	5C17 Accident Cnt: <input type="text"/>	5C16 Speed: <input type="text"/> mph
		5C17 Accident Rate: <input type="text"/>	6C27 ADTT: <input type="text"/>	6C28 ADTT Year: <input type="text"/>
Highway Networks and Service Classifications		Clearances		Width
5C18 Mile Pt: <input type="text"/> mi	5C19 Nat Base Net: 0 - Not on Base Network	5C24 Vertical: <input type="text"/>	5C26 Appr. Road: <input type="text"/> ft	
5C20 LRS Inventory Rte: <input type="text"/>	5C21 Toll Facility: 3 - On free road	5C25 Horiz: <input type="text"/>	5C27 Brdg Rdwy Width (C/C): <input type="text"/> ft	
5C22 Functional Class: 17 - Urban Collector	5C23 Traffic Direction: 2 - 2-way traffic	Alternate Classifications		
		5C28 Defense Hwy: 1 - Inter. STRAHNET Rt.	5C30 SB: <input type="checkbox"/>	
		5C29 Nat. Hwy Sys: 0 - Not on NHS	5C32 Trans: <input type="checkbox"/>	
		5C31 Fed Lands Hwy: 1 - IRR-Indian Res Rd	5C34 Emer: <input type="checkbox"/>	
		5C33 Nat. Truck Network: 0 - Not part of natl net		
		5C35 RMS Roadway BPN: <input type="text"/>		
State Roadway Location		Roadway Admin		
6C01 County: <input type="text"/>	6C02 St Rte Num: <input type="text"/>	6C05 Adm Juris: <input type="text"/>	6C07 Govt. Cont: -1	
6C03 Seg: <input type="text"/>	6C04 Offset: <input type="text"/>	6C06 Fed Aid: <input type="text"/>	6C08 Urban/Rural: <input type="text"/>	
		6C09 Hwy Ind: N - Non-network	6C10 Hwy Sys Typ: -1	

Figure 2.4.3.2-1 Roadway Detail Screen

2.4.3.3 Waterway Detail

The Waterway Detail screen allows users to view and maintain detail information about a specific waterway associated with a structure. This screen can be accessed in Edit mode by authorized users. Changes to data on this screen are saved to the production BMS2 database.

In addition to the standard Back, Save and Save & Exit buttons, this screen also provides a Delete button to remove the currently-displayed waterway, a New button to create a new waterway, and Previous and Next buttons that allow the user to display the next or previous waterway item in the list.

The screenshot shows the 'Waterway Detail' screen in the BMS2 system. At the top, there is a navigation bar with the title 'INVENTORY - FEATURES INTERSECTED' and a 'Hide Quick Links' option. Below this are search filters for '5A01 SR ID', '5A03 BRKEY', 'Agency ID', and 'Go To'. The main content area is divided into three columns of links: 'Inventory Links', 'Inspection Links', and 'Other Links'. The 'WATERWAY DETAIL' section contains several input fields and dropdown menus for navigation and control parameters. The 'Waterway' section contains fields for stream name, classification, drainage area, fishability, primary waterway status, and elevation. The 'Design Flood Data' section contains fields for magnitude, frequency, elevation, velocity, pollutant description, and stream restriction description.

Figure 2.4.3.3-1 Waterway Detail Screen

2.4.3.4 Railroad Detail

The Railroad Detail screen allows users to view and maintain detail information about a specific railroad associated with a structure. This screen can be accessed in Edit mode by authorized users. Changes to data on this screen are saved to the production BMS2 database.

In addition to the standard Back, Save and Save & Exit buttons, this screen also provides a Delete button to remove the currently-displayed railway, a New button to create a new railway, and Previous and Next buttons that allow the user to display the next or previous railway item in the list.

INVENTORY - FEATURES INTERSECTED Hide Quick Links

5A01 SR ID: 5A03 BRKEY: Agency ID: Go To: Inventory - Features Intersected

Inventory Links	Inspection Links	Other Links
Structure Home	Ratings & Schedule	Search Structures
Agency Bridge	Agency Inspection	Last Search Results
Features	Notes & Comments	EDMS Documents
Structure Units	Element Condition	Proposed Maintenance
Drawing Notes	Fracture Critical	Completed Maintenance
Structure Group		BP Assignment
Posting	Signing Details	Reports
Inspection Planning	Safety Features	Bulletin Board
Paint	Load Ratings	Validations: 0 0 0 0
Design	Underwater	Risk Assessment Search
Risk Assessment Detail		Last Risk Assessment Search Results

RAILROAD DETAIL

FR01 RR Name: 5C03 On/Under:

FR03 Service Status: FR04 RR Milepost:

FR05 AAR DOT Num:

FR06 Num of Electrified Tracks:

FR07 Total Num of Tracks:

FR08 Span Desc:

FR09 Additional Operator:

FR17 RR Division:

FR18 RR Subdivision:

FR19 RR Branch:

FR20 RR Owner:

Clearance

4A20 Min Lat Under (Left):

4A19 Min Lat Under (Right):

FR10 Min Over Vert (Left): ft

FR11 Min Over Vert (Right): ft

FR12 Horiz (Left): ft

FR13 Horiz (Right): ft

FR14 Def Vert (left): ft

FR15 Def Vert (Right): ft

FR16 Notes:

6C34 Feature Type:

Figure 2.4.3.4-1 Railroad Detail Screen

2.4.3.5 Utility Detail

The Utility Detail screen is to allow users to view and maintain detail information about a specific utility associated with a structure. This screen can be accessed in Edit mode by authorized users. Changes to data on this screen are saved to the production BMS2 database.

In addition to the standard Back, Save and Save & Exit buttons, this screen also provides a Delete button to remove the currently-displayed utility, a New button to create a new utility, and Previous and Next buttons that allow the user to display the next or previous waterway item in the list.

Figure 2.4.3.5-1 Utility Detail Screen

2.4.4 Structure Units

2.4.4.1 Structure Unit / Span List

The Structure Unit / Span List screen allows users to view and maintain the individual structure units for a structure. This screen displays a list of structure units for the current structure sorted by structure unit type.

Structure units are typically main and approach spans, piers, abutments, wing walls, etc. Every structure in BMS2 also has a Frame structure unit that represents the composite of all main and approach spans. During an iForms inspection, the element condition data is automatically rolled up to the Frame. *This screen does not allow a Frame structure unit to be deleted.*

This screen can be accessed in Edit mode by authorized users. In edit mode, an Add link is provided for users to create a new structure unit. Each structure unit in the list also has two links, Edit and Remove, which allow users to view and edit the structure unit detail data or remove the structure unit, respectively.

In view mode, each item includes a single View link to access the corresponding Detail screen.

INVENTORY - STRUCTURE UNITS					Hide Quick Links
SA01 SR ID: <input type="text"/>	SA03 BRKEY: <input type="text"/>	Agency ID: <input type="text"/>	Go To: Inventory - Structure Units		
Inventory Links Structure Home Agency Bridge Features Structure Units Drawing Notes Structure Group		Inspection Links Posting Inspection Planning Paint Design Risk Assessment Detail		Other Links Search Structures Last Search Results EDMS Documents Proposed Maintenance Completed Maintenance BP Assignment	
Number of Spans Copy Structure Unit		SB11 Number of Main Spans: 2		SB14 Number of Approach Spans: 0	
Records 1 to 8 of 8					Records Per Page: 10
SD01 Unit Key	SP01 Type	SP02 Unit ID	SP03 Span Length	Action	
1	M - Main	Span 1	-1.0		
2	F - Frame	Unit 2	-1.0		
3	B - Abutment	FAB	-1.0		
6	P - Pier	P02	-1.0		
5	P - Pier	P01	-1.0		
8	M - Main	Span 2	-1.0		
7	P - Pier	P03	-1.0		
4	B - Abutment	NAB	-1.0		

Figure 2.4.4.1-1 Structure Unit / Span List Screen

2.4.4.2 Structure Unit / Span Detail

The Structure Unit / Span Detail screen allows users to view and edit detailed information for a structure unit and to enter information for new structure units. Most of the fields apply only to Main and Approach span structure units. If the user attempts to enter the SP03 - SP10 fields or the 5D05 Default Bridge Unit field and the selected structure unit type is not Main Span or Approach Span, an error message is displayed.

This screen can be accessed in Edit mode by authorized users. Changes to data on this screen are saved to the production BMS2 database.

In addition to the standard Back, Save and Save & Exit buttons, this screen also provides a Delete button to remove the currently-displayed structure unit, a New button to create a new structure unit, and Previous and Next buttons that allow the user to display the next or previous structure units in the list.

Users cannot create additional main or approach span structure units if the resulting number of spans will exceed the sum of the main and approach span values entered on the Structure Home screen (the sum of the SPANS and APPRSPANS in the BRIDGE table). Also, users cannot create or remove Frame or APRAS Span structure units types.

Figure 2.4.4.2-1 Structure Unit / Span Detail Screen

2.4.5 Drawing Notes

2.4.5.1 Drawing General Information and List

The Drawing Notes screen allows users to view and maintain detailed information for drawings and high-level design information. The fields VN01 - VN04 can be modified directly on the screen and saved to the BMS2 Database using the Save button.

This screen also provides a list of drawings associated with the structure. Although displayed as separate Design, Shop and Repair drawing previously, on this screen all drawing types are listed together in a single VN05-VN07 Drawing Type list. Detail data for these drawing list items cannot be directly edited on this screen - the user must select one of the displayed items and proceed to a corresponding Detail screen to edit data (assuming the user has the necessary security authorization).

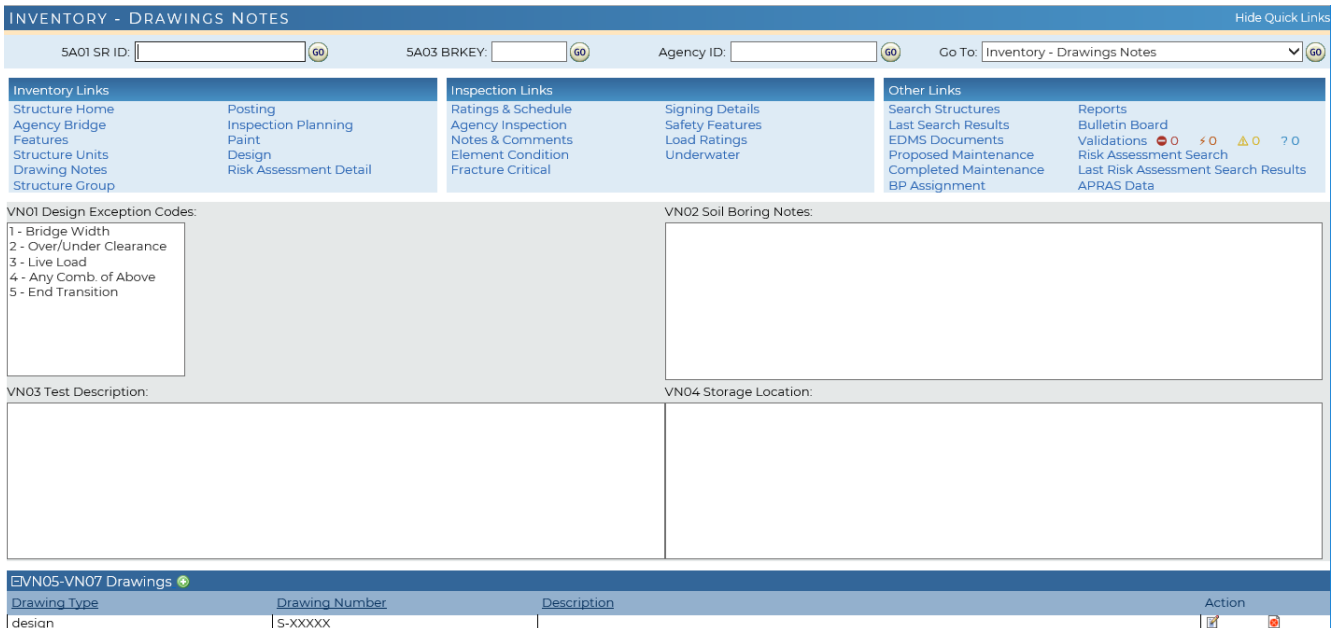


Figure 2.4.5.1-1 Drawing Notes Screen

In edit mode, an Add link is provided for users to create a new design, shop or repair drawing. Each drawing in the list also has two links, Edit and Remove, which allow users to view and edit the drawing detail data or remove the drawing, respectively.

In view mode, each item includes a single View link to access the corresponding Detail screen.

2.4.5.2 Drawing Detail

The Drawing Detail screen allows users to view and maintain detailed information about design, repair and shop drawings for a structure.

This screen can be accessed in Edit mode by authorized users. Changes to data on this screen are saved to the production BMS2 database.

The Previous and Next buttons allow the user to display the next or previous drawing in the list. The Save button saves any modified fields to the BMS2 database. The New and Delete buttons are used to add a new drawing record or remove the current drawing, respectively.

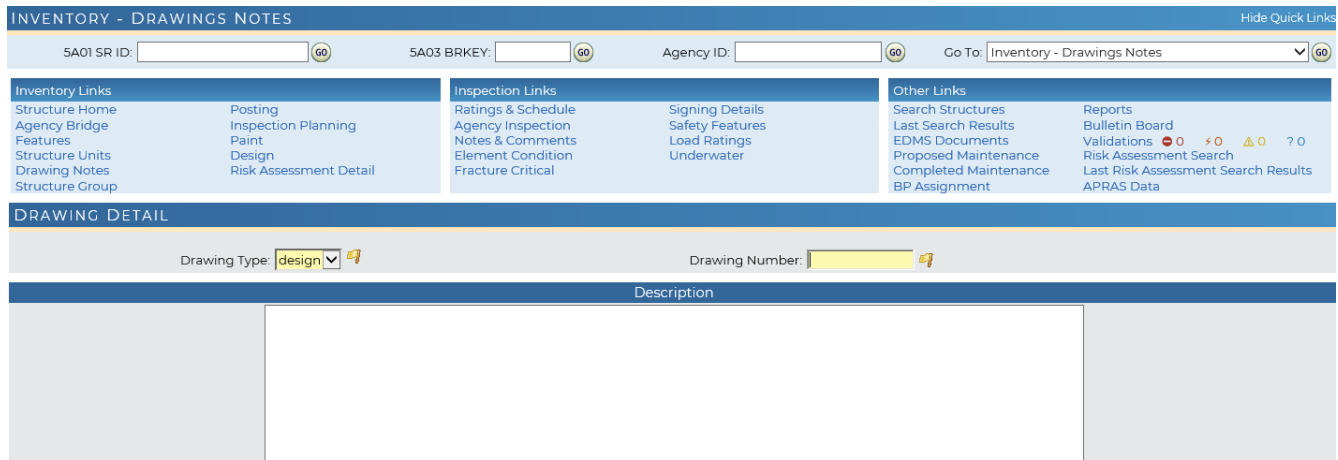


Figure 2.4.5.2-1 Drawing Detail Screen

2.4.6 Posting

2.4.6.1 Posting List

The Posting screen allows users to edit the current active posting information for a structure. A “posting history” record is created each time the user changes the Status Date, the Posting status, the Special Restrictive Posting or any of the posted weight limits (fields VP01 through VP05) and saves the information. If any other fields are modified, the changes are saved directly to the current active posting record. After a posting record is added to BMS2 and saved, it cannot be deleted.

This screen can be accessed in Edit mode by authorized users. Changes to data on this screen are saved to the production BMS2 database.

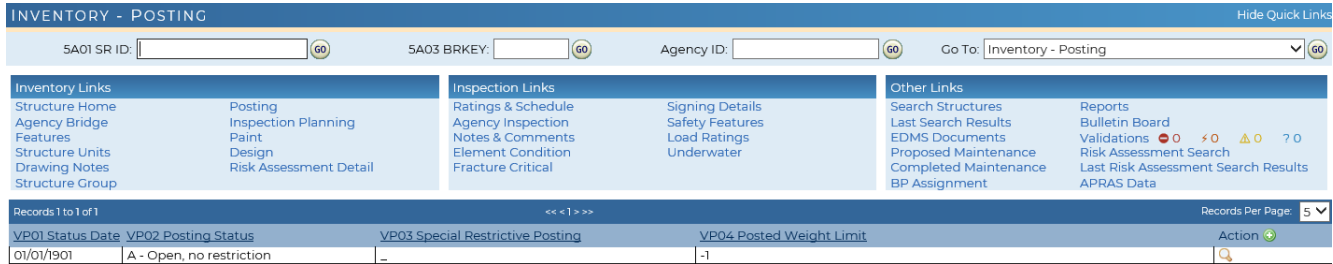


Figure 2.4.6.1-1 Posting Screen

2.4.6.2 Posting Detail

The Posting Detail screen allows users to maintain detail information about posting history of the bridge.

This screen can be accessed in Edit mode by authorized users. Changes to data on this screen are saved to the production BMS2 database.

The Save button saves any modified fields to the BMS2 database. The New button is used to add a new posting record.

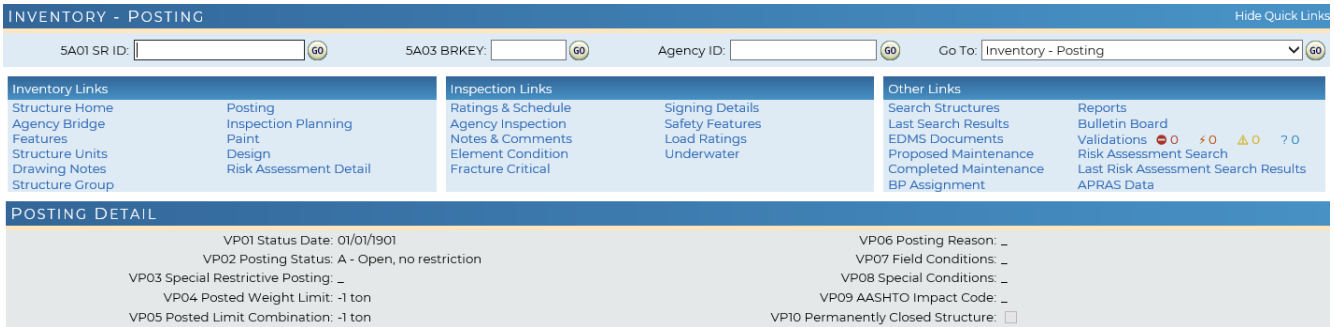


Figure 2.4.6.2-1 Posting Detail Screen

2.4.7 Inspection Planning

2.4.7.1 General Information and Lists

The Inspection Planning screen allows users to view and maintain information that is useful for planning the inspections for a structure. This screen presents general inspection planning information corresponding to the inspection planning fields VI01 – VI11.

Below the general inspection planning information are two list sections, one for Equipment and one for Permits. Detail data for these list items cannot be directly edited on this screen – the user must select one of the displayed items and proceed to a corresponding Detail screen to edit data (assuming the user has the necessary security authorization).

The screenshot displays the 'INVENTORY - INSPECTION PLANNING' interface. At the top, there are search fields for '5A01 SR ID', '5A03 BRKEY', and 'Agency ID', each with a 'GO' button. A 'Go To' dropdown menu is set to 'Inventory - Inspection Planning'. Below this is a navigation bar with three main sections: 'Inventory Links', 'Inspection Links', and 'Other Links'. 'Inventory Links' includes Structure Home, Agency Bridge, Features, Structure Units, Drawing Notes, and Structure Group. 'Inspection Links' includes Ratings & Schedule, Agency Inspection, Notes & Comments, Element Condition, and Fracture Critical. 'Other Links' includes Search Structures, Last Search Results, EDMS Documents, Proposed Maintenance, Completed Maintenance, BP Assignment, Reports, Bulletin Board, Validations (with counts for red, yellow, and green), Risk Assessment Search, Last Risk Assessment Search Results, and APRAS Data. A 'Miscellaneous' section contains fields for VI01 Min Crane Reach (with a unit 'ft'), VI03 RR Flagger Required (checkbox), VI02 High Voltage Power Line Ind. (checkbox), and VI04 Traffic Flagger Required (checkbox). A 'Sidewalk' section includes dropdowns for VI05 Type (Left), VI06 Type (Right), VI07 Width (Left) (0.0ft), VI08 Width (Right) (0.0ft), and VI09 Horizontal Curve (with a unit 'ft'). Below this is a section for 'VIII Inspection Limitations' which is currently empty. At the bottom, there are expandable sections for 'Equipment' and 'Permits'.

Figure 2.4.7.1-1 Inspection Planning Screen

In edit mode, the header for each list section contains a Create link. Clicking on the link allows users to create a new equipment or permit item. Each list item also has two links, Edit and Remove, which allow users to view and edit the corresponding detail data or remove the item, respectively. In view mode, each list item includes a single View link to access the corresponding Detail screen.

2.4.7.2 Equipment Detail

The Equipment Detail screen allows users to maintain detail information about equipment used for inspection of the structure.

This screen can be accessed in Edit mode by authorized users. Changes to data on this screen are saved to the production BMS2 database.

The Previous and Next buttons allow the user to display the next or previous equipment item in the list. The Save button saves any modified fields to the BMS2 database. The New and Delete buttons are used to add a new equipment record or remove the current equipment record, respectively.

INVENTORY - INSPECTION PLANNING Hide Quick Links

5A01 SR ID: 5A03 BRKEY: Agency ID: Go To: Inventory - Inspection Planning

Inventory Links	Inspection Links	Other Links
Structure Home	Ratings & Schedule	Search Structures
Agency Bridge	Agency Inspection	Last Search Results
Features	Notes & Comments	EDMS Documents
Structure Units	Element Condition	Proposed Maintenance
Drawing Notes	Fracture Critical	Completed Maintenance
Structure Group		BP Assignment
Posting	Signing Details	Reports
Inspection Planning	Safety Features	Bulletin Board
Paint	Load Ratings	Validations <input type="button" value="0"/> <input type="button" value="0"/> <input type="button" value="0"/> <input type="button" value="0"/>
Design	Underwater	Risk Assessment Search
Risk Assessment Detail		Last Risk Assessment Search Results
		APRAS Data

EQUIPMENT DETAIL

Equipment ID: VI12 Equipment Type: (blank)
VI13 Equipment Qty: VI14 Consumable:
VI15 Assigned To:

VI16 Notes

Figure 2.4.7.2-1 Equipment Detail Screen

2.4.7.3 Permit Detail

The Permit Detail screen allows users to maintain detail information about permits that may be required for inspection of the structure.

This screen can be accessed in Edit mode by authorized users. Changes to data on this screen are saved to the production BMS2 database.

The Previous and Next buttons allow the user to display the next or previous permit item in the list. The Save button saves any modified fields to the BMS2 database. The New and Delete buttons are used to add a new permit record or remove the current permit record, respectively.

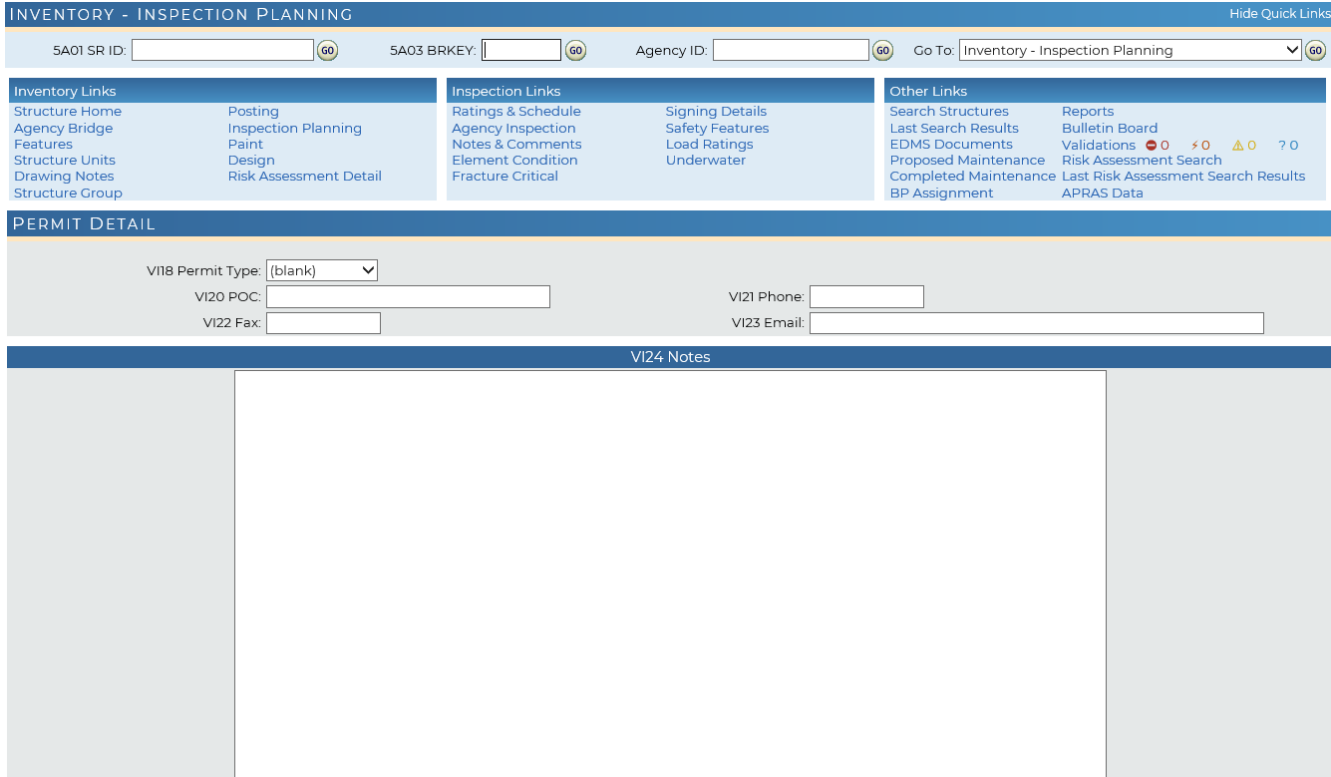


Figure 2.4.7.3-1 Permit Detail Screen

2.4.8 Design

2.4.8.1 Design Information and Lists

The Design screen allows users to view and maintain design-related information for a structure.

This screen presents information related to different aspects of the structure design such as superstructure, substructure, culvert, etc. All information on this screen, with the exception of the substructure pier type, culvert and expansion joint list sections, can be edited and saved to the BMS2 database using the Save button.

The screenshot displays the 'INVENTORY - DESIGN' interface. At the top, there are search fields for '5A01 SR ID', '5A03 BRKEY', and 'Agency ID', along with a 'Go To' dropdown menu set to 'Inventory - Design'. Below this is a navigation menu with three main sections: 'Inventory Links', 'Inspection Links', and 'Other Links'. The 'Inventory Links' section includes 'Structure Home', 'Agency Bridge Features', 'Structure Units', 'Drawing Notes', and 'Structure Group'. The 'Inspection Links' section includes 'Posting', 'Inspection Planning', 'Paint', 'Design', and 'Risk Assessment Detail'. The 'Other Links' section includes 'Search Structures', 'Last Search Results', 'EDMS Documents', 'Proposed Maintenance', 'Completed Maintenance', 'BP Assignment', 'Reports', 'Bulletin Board', 'Validations', 'Risk Assessment Search', 'Last Risk Assessment Search Results', and 'APRAS Data'. The main content area is divided into sections for 'Superstructure Steel', 'Superstructure Concrete', and 'Substructure'. Each section contains various dropdown menus and input fields for design parameters such as 'VD01 Design Method', 'VD02 Live Load Continuity', 'VD03 Geometry', 'VD04 Steel Beam Splice', 'VD05 Steel Types', 'VD06 Vacuum Process', 'VD07 Strand Type', 'VD08 Comp Strength @ 28 days', 'VD09 Comp Strength @ Release', 'VD10 Prestressed Splice Type', 'VD11 Design Tension Methods', 'VD12 Void Types', 'VD13 Strand Sizes', 'VD14 Abutment Type', and 'VD17 Pier Foundation Types'. The 'VD12 Void Types' dropdown is expanded, showing options: 0 - No Void, 1 - Rectangular void, 2 - Special Void, 3 - Twin circular void, and 4 - Single circular void. The 'VD13 Strand Sizes' dropdown is also expanded, showing options: 1 - 5/16" or smaller, 2 - 3/8" diameter, 3 - 7/16" diameter, 4 - 1/2" diameter, 5 - 0.6" diameter, 6 - 1/2" special, and A - 7/16" coated.

Figure 2.4.8.1-1 Inventory Design Screen – Part 1

The Inventory Design screen includes list sections for Substructure Pier Type, Culvert and Expansion Joint, which each have corresponding detail screens for editing. Each list section displays data characteristic of the corresponding list item. Detail data for these list items cannot be directly edited on this screen – the user must select one of the displayed items and proceed to a corresponding Detail screen to edit data (assuming the user has the necessary security authorization).

In edit mode, the header for each list section contains a Create link. Clicking on the link allows users to create a new item of the corresponding type (pier type, culvert opening, etc.) Each list item also has two links, Edit and Remove, which allow users to view and edit the corresponding detail data or remove the item, respectively.

In view mode, each list item includes a single View link to access the corresponding Detail screen.

Substructure

VD14 Abutment Type: Near: (blank) Far: (blank)

VD15 Abutment Foundation Type: Near: (blank) Far: (blank)

VD17 Pier Foundation Types: A - Foot on bedrock, B - CIP conc piles, C - Precast conc piles, D - P/S conc piles, E - Steel H-piles, F - Steel pipe piles, G - Timber piles, H - Drilled caisson

EVD16 Pier Types

ECulvert

EExpansion Joint

Other

VD28 Haunch Type: (blank)

VD29 Special Pier Cap: (blank)

VD31 Bridge Seat Cleaning: []

VD32 Bridge Seat Cleaning Note: []

VD33 Scuppers with Downspouts: []

VD34 Scuppers without Downspouts: []

VD30 Bearing Types: 01 - Fixed thru dowels, 02 - Exp. thru dowels, 03 - Steel Plates, 04 - Lubrite Plates, 05 - Rockers, 06 - Rocker Nest, 07 - Rollers, 08 - Roller-Nest-Open, 09 - Roller-Nest-Encl, 10 - Neoprene (plain)

Figure 2.4.8.1-2 Inventory Design Screen - Part 2

Multi-Select Fields

The Design screen provides multi-selection fields that allow users to choose more than one selection in a drop down. Multi-selection fields are provided for VD05 Steel Type, VD12 Void Types, VD17 Pier Foundation Type and VD30 Bearing Types. To highlight multiple items in the Multi-Select fields use the standard Windows procedure for multi-selection:

1. Hold down the Ctrl Key while clicking on your desired selections in the list using the left mouse button.
2. When complete, click Save at the top of the screen.
3. When saved the chosen selections are highlighted and displayed at the top of the dropdown list, out of sequence with the remainder of the selection items.

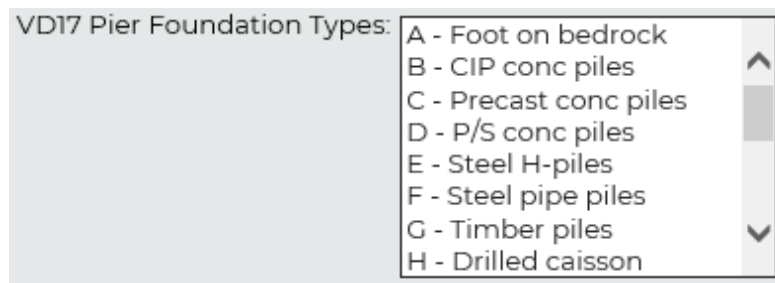


Figure 2.4.8.1-3 A Multi-Select Field

2.4.8.2 Design - Pier Type Detail

The Pier Type Detail screen allows users to view and maintain detailed information about substructure pier types associated with a structure.

This screen can be accessed in Edit mode by authorized users. Changes to data on this screen are saved to the production BMS2 database.

The Previous and Next buttons allow the user to display the next or previous pier type in the list. The Save button saves any modified fields to the BMS2 database. The New and Delete buttons are used to add a new pier type record or remove the current pier type, respectively.



Figure 2.4.8.2-1 Pier Type Detail Screen

2.4.8.3 Design - Culvert Detail

The Culvert Detail screen allows users to view and maintain detailed information about culvert openings associated with the structure.

This screen can be accessed in Edit mode by authorized users. Changes to data on this screen are saved to the production BMS2 database.

The Previous and Next buttons allow the user to display the next or previous culvert opening in the list. The Save button saves any modified fields to the BMS2 database. The New and Delete buttons are used to add a new culvert opening record or remove the current culvert opening, respectively.

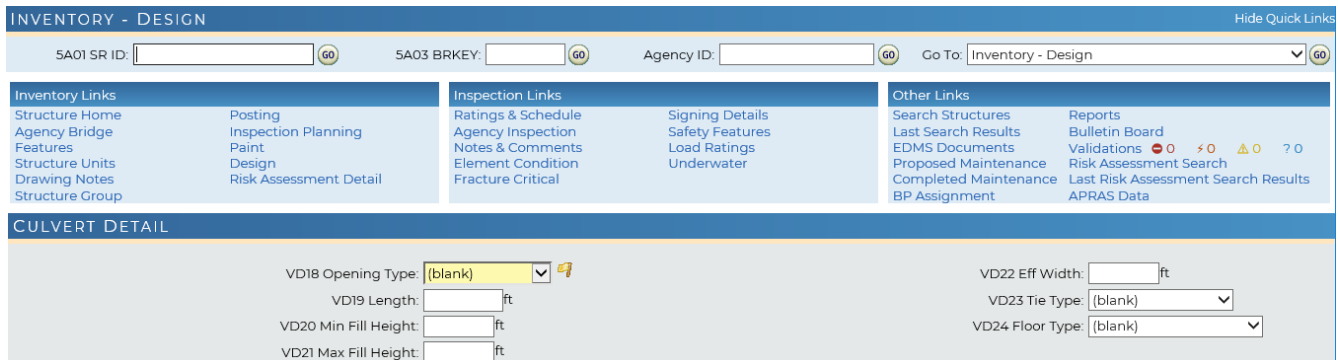


Figure 2.4.8.3-1 Culvert Detail Screen

2.4.8.4 Design - Expansion Joint Detail

The Expansion Joint Detail screen allows users to view and maintain detailed information about expansion joints associated with a structure.

This screen can be accessed in Edit mode by authorized users. Changes to data on this screen are saved to the production BMS2 database.

The Previous and Next buttons allow the user to display the next or previous expansion joint in the list. The Save button saves any modified fields to the BMS2 database. The New and Delete buttons are used to add a new expansion joint record or remove the current expansion joint, respectively.

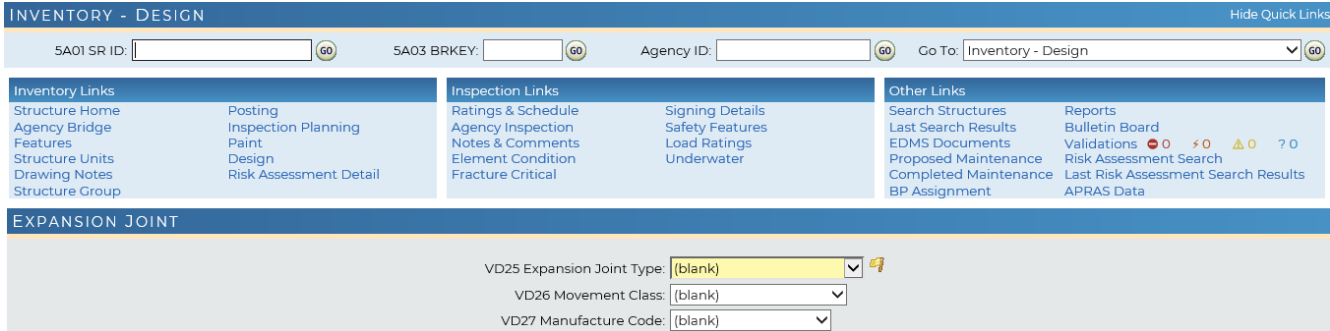


Figure 2.4.8.4-1 Design - Expansion Joint Detail Screen

2.4.9 Inventory – Signs and Lights

The Inventory – Signs and Lights screen serves as the summary page for sign and light structures. This screen presents both display only and editable fields relating to sign and light structures. The display only fields are editable on other inventory screens such as Structure Home, Agency Bridge, and Features.

This screen can be accessed in Edit mode by authorized users. Changes to data on this screen are saved to the production BMS2 database.

Figure 2.4.9-1 Inventory – Signs and Lights Screen

2.4.10 Inventory - Walls

The Inventory - Walls screen serves as the summary page for wall structures. This screen presents both display only and editable fields relating to wall structures. The display only fields are editable on other inventory screens such as Structure Home, Agency Bridge, and Features.

This screen can be accessed in Edit mode by authorized users. Changes to data on this screen are saved to the production BMS2 database

The screenshot displays the 'INVENTORY - WALLS' web application interface. At the top, there is a search bar with fields for '5A01 SR ID', '5A03 BRKEY', and 'Agency ID', each with a 'GO' button. A 'Go To' dropdown menu is set to 'Inventory - Walls'. Below the search bar are three main navigation sections: 'Inventory Links' (Structure Home, Agency Bridge, Features, Structure Units, Drawing Notes, Structure Group), 'Inspection Links' (Ratings & Schedule, Agency Inspection, Notes & Comments, Signing Details, Safety Features, Inspection - Walls), and 'Other Links' (Search Structures, Last Search Results, EDMS Documents, Proposed Maintenance, Completed Maintenance, BP Assignment, Reports, Bulletin Board, Validations, Risk Assessment Search, Last Risk Assessment Search Results, APRAS Data). The main content area is divided into three sections: 'General Information' with fields for foundation type, backfill/damping, historic eligibility, manufacturer, wall use, mount type, post type, year built, and reconstruct year; 'Structure Type' with fields for material, physical, and interaction types; and 'Measurements' with fields for county, segment, offset, distance to road, slope, and clearance. A 'Structure Notes' section at the bottom contains a '2A01 Notes' field.

Figure 2.4.10-1 Inventory - Walls Screen

2.4.11 Paint

2.4.11.1 Paint History

The Paint screen allows users to maintain detail information about equipment used for inspection of the structure. This screen can be accessed in Edit mode by authorized users. Changes to data on this screen are saved to the production BMS2 database.

INVENTORY - PAINT Hide Quick Links				
5A01 SR ID: <input type="text"/>	5A03 BRKEY: <input type="text"/>	Agency ID: <input type="text"/>	Go To: <input type="text" value="Inventory - Paint"/>	
Inventory Links Structure Home Agency Bridge Features Structure Units Drawing Notes Structure Group		Inspection Links Ratings & Schedule Agency Inspection Notes & Comments Element Condition Fracture Critical		Other Links Search Structures Last Search Results EDMS Documents Proposed Maintenance Completed Maintenance BP Assignment
				Reports Bulletin Board Validations 0 0 0 0 Risk Assessment Search Last Risk Assessment Search Results APRAS Data
Paint History Records Per Page: 5				
Records 1 to 1 of 1 << 1 >>				
VA01 Paint Date	VA02 Paint Extent	VA03 Steel (ton)	VA04 Surface Area (sq. ft)	Action
12/01/1971	-	157	-1	

Figure 2.4.11.1-1 Paint Screen

2.4.11.2 Paint Detail

The Paint Detail screen allows users to maintain detailed information about the paint history of the structure. The screen displays details of painting history of the structure. Each painting detail is its own record.

This screen can be accessed in Edit mode by authorized users. Changes to data on this screen are saved to the production BMS2 database.

The Previous and Next buttons allow the user to display the next or previous permit item in the list. The Save button saves any modified fields to the BMS2 database. The New and Delete buttons are used to add a new permit record or remove the current permit record, respectively.

The screenshot shows the 'INVENTORY - PAINT' interface. At the top, there are search fields for '5A01 SR ID', '5A03 BRKEY', and 'Agency ID', along with a 'Go To' dropdown menu set to 'Inventory - Paint'. Below this is a navigation menu with four categories: 'Inventory Links', 'Inspection Links', 'Signing Details', and 'Other Links'. The main content area is titled 'PAINT DETAIL' and is organized into three sections:

- Paint History:** Contains fields for 'VA01 Date Applied' (calendar icon), 'VA02 Paint Extent' (dropdown menu), 'VA03 Steel (ton)' (text input), and 'VA04 Surface Area (sq.ft)' (text input).
- Paint Type:** Contains fields for 'VA05 Primer' (dropdown menu), 'VA06 Intermediate' (dropdown menu), and 'VA07 Finish' (dropdown menu).
- Paint Detail:** Contains fields for 'VA08 Paint Color' (dropdown menu), 'VA09 Number of Coats' (text input), 'VA10 Thickness (mils)' (text input), 'VA11 Paint Volume (gal)' (text input), 'VA12 Cleaning Type' (dropdown menu), 'VA13 Paint Cost (\$M)' (text input), and 'VA14 Notes' (large text area).

Figure 2.4.11.2-1 Paint Detail Screen

2.4.12 Inventory - Tunnels

The Inventory - Tunnel screen serves as the summary page for tunnel structures. This screen presents both display only and editable fields relating to tunnel structures. The display only fields are not editable because there are no tunnel structures within Pennsylvania that would require different coding values. Only tunnel inventory items from the Specification for the National Tunnel Inventory (SNTI) that are not duplicates of fields used on other screens throughout BMS2 are shown on this screen. For coding guidance, refer to the SNTI as these field descriptions do not appear within this publication. A table of all SNTI items and their corresponding BMS2 fields appears in BMS2 is provided in Appendix D.

This screen can be accessed in Edit mode by authorized users. Changes to data on this screen are saved to the production BMS2 database

The screenshot shows the 'INVENTORY - TUNNEL' interface. At the top, there are search fields for '5A01 SR ID', '5A03 BRKEY', and 'Agency ID', each with a 'GO' button. A 'Go To' dropdown menu is set to 'Inventory - Tunnel'. Below this are three columns of links: 'Inventory Links' (Structure Home, Agency Bridge, etc.), 'Inspection Links' (Ratings & Schedule, Agency Inspection, etc.), and 'Other Links' (Search Structures, Reports, etc.). The main form area is organized into sections: 'Identification Items' (I.15-I.18), 'Structure Type And Material Items' (S.1-S.5), 'Navigation' (N.1-N.3), 'Age and Service Items' (A.8), and 'Classification Items' (C.3-C.8). Each section contains specific data fields, many of which are dropdown menus.

Figure 2.4.12-1 Inventory - Tunnel Screen

2.4.13 Risk Score

2.4.13.1 Risk Score Detail

The Risk Score Detail Screen provides the scoring, ranking, and MPMS data for the selected structure in multicolumn format. Comments pertaining to Risk Score can be entered in the block provided.

INVENTORY - RISK ASSESSMENT			Hide Quick Links
5A01 SR ID: <input type="text"/>	5A03 BRKEY: <input type="text"/>	Agency ID: <input type="text"/>	Go To: Inventory - Risk Assessment
Inventory Links Structure Home Agency Bridge Features Structure Units Drawing Notes Structure Group	Posting Inspection Planning Paint Design Risk Assessment Detail	Inspection Links Ratings & Schedule Agency Inspection Notes & Comments Element Condition Fracture Critical	Other Links Search Structures Last Search Results EDMS Documents Proposed Maintenance Completed Maintenance BP Assignment
Structure Identification 5A01 Structure ID: _____ 5A02 Name: _____ Baseline Date: _____			
Score & Rank Current Risk Score: _____ Current State Rank: _____ Current District Rank: _____ Current County Rank: _____ Current MPO Rank: _____			
MPMS Primary MPMS#: _____ Secondary MPMS#: _____			
Risk Assessment Comment <input type="text"/>			

Figure 2.4.13.1-1 Risk Score Detail Screen

The MPMS field data cannot be changed by the user. The MPMS numbers returned for the structure are selected using algorithms based on current date and future or past let dates. Secondary numbers will only be generated if there is more than one record existing for the bridge. A null value in that field indicates there is one only one record available. Both the Structure list screen and the Risk Score Crystal Report will also show the MPMS data.

2.4.14 Structure Group

The Structure Group screen is used to provide links between structures within BMS2. These groups fall into specific categories, predecessor/successor, interchange, border and test groups with groups being entered into the system by Department staff and viewable by all users of BMS2. The screen displays the SG - Structure Group fields as well as other basic identifiers from the 5A - ID/Admin and 7A - Inspection Schedule fields.

The predecessor/successor relationship is used to identify bridges that have been replaced by a new bridge. This relationship can be created during the "Create Structure" process or via this screen. Interchange groups are used to identify a series of bridges that make up an interchange such as the Eisenhower Interchange in Harrisburg or the Mount Nittany Interchange in State College. In these instances, it may be helpful for the District to be able to create a group for inspectors to identify all the bridges in a close area. The border bridges group is simply an identifier of a bridge that either borders two counties within PA or spans between Pennsylvania and another state. The test structure group is used by Central Office to identify bridges used during the implementation of changes into the production database.



Figure 2.4.14 Structure Group Screen

2.5 Inspection Screens

2.5.1 Selecting an Inspection

Every Inspection-related screen in BMS2 Web includes a dropdown list in the screen header that provides the list of inspection dates for the structure.

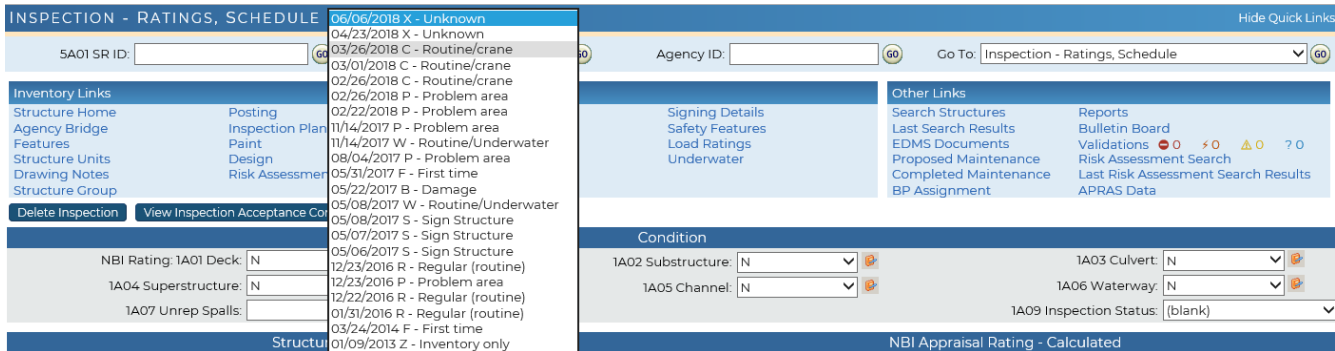


Figure 2.5.1-1 Inspection Date Drop Down Expanded

By default, inspection-related BMS2 Web screens display the most recent inspection for the structure. The current inspection remains as the displayed inspection as the user navigates to other Inspection or Inventory screens. However, if the user selects a prior inspection for display, BMS2 Web will continue to display data from that prior inspection information on other inspection-related screens as long as the user directly navigates to those other Inspection-related screens.

If the user selects a prior inspection for display and navigates “outside” of the Inspection-related screens (e.g., to an Inventory screen such as Agency Bridge), if the user then returns to an Inspection screen BMS2 Web will again default back to displaying the most recent inspection information.

2.5.2 Ratings & Schedule

2.5.2.1 Ratings & Schedule Screen

The purpose of this screen is to allow users to view and maintain basic NBI inspection condition and schedule data for a structure. This screen displays component level condition ratings, and other rating and inspection scheduling information for the structure.

This screen can be accessed in Edit mode by authorized users. The Save button saves modified fields to the production BMS2 database.

The screenshot displays the 'INSPECTION - RATINGS, SCHEDULE' web application interface. At the top, there is a search bar with fields for '5A01 SR ID', '5A03 BRKEY', and 'Agency ID', along with a 'Go To' dropdown menu set to 'Inspection - Ratings, Schedule'. Below the search bar are three columns of links: 'Inventory Links' (Structure Home, Agency Bridge, Features, Structure Units, Drawing Notes, Structure Group), 'Inspection Links' (Ratings & Schedule, Agency Inspection, Notes & Comments, Element Condition, Fracture Critical, Signing Details, Safety Features, Load Ratings, Underwater), and 'Other Links' (Search Structures, Last Search Results, EDMS Documents, Proposed Maintenance, Completed Maintenance, BP Assignment, Reports, Bulletin Board, Validations, Risk Assessment Search, Last Risk Assessment, Search Results). The main content area is divided into several sections: 'Condition' with dropdowns for 1A01-1A09; 'Structure Appraisal' with dropdowns for 4A02-4A14; 'Schedule Summary' with dropdowns for 7A01-7A05; '7A06 Inspection Performed' with checkboxes for National Bridge Inventory, Element, Fracture Critical, Underwater, and Other Special; and 'Bridge Inspection Resources' with input fields for 7A11-7A17. A 'Schedule' table is also present, showing required dates and frequencies for various inspection types.

Figure 2.5.2.1-1 Ratings & Schedule Screen

This screen includes a direct link to the Inspection Comments screen for each of the condition rating fields. When one of the detailed comments links is clicked, the Inspection Comment List screen is displayed showing only those comments that apply to the corresponding condition rating. This is the view a user will see after clicking the screen link when the bridge is in "9 - Accepted" status (Field 1A09).

2.5.2.2 Key Field Comparison

The purpose of this portion of the screen is to alert the review of a bridge not in “9 – Accepted” status to the protentional changes from the current inspection and the last accepted inspection. When there is a difference in the specified fields, both the field name, the current inspection value and the last accepted inspection value are highlighted in yellow. The key fields listed on the screen include the condition ratings for deck, substructure, culvert, superstructure, channel, and waterway as well as the scour critical bridge indicator and associated scour critical category, structural deficiency status, and the structural evaluation rating. The comparison also evaluates the required inspection types and inspection frequencies for NBI, Fracture Critical, Underwater, Other Special and Element inspection types.

The Key Field Comparison portion of the Ratings and Schedules screen is visible to all users and is read-only.

The screenshot displays the 'INSPECTION - RATINGS, SCHEDULE' interface. At the top, there are search fields for '5A01 SR ID', '5A03 BRKEY', and 'Agency ID', along with a 'Go To' dropdown menu. Below these are three main navigation sections: 'Inventory Links', 'Inspection Links', and 'Other Links'. The 'Inspection Links' section is active, showing 'Ratings & Schedule' selected. The main content area is titled 'Condition' and contains several dropdown menus for fields like '1A01 Deck', '1A02 Substructure', '1A03 Culvert', '1A04 Superstructure', '1A05 Channel', '1A06 Waterway', '1A07 Unrep Spalls', '1A09a Inspection Reviewer', and '1A09 Inspection Status'. Below this is a green header for the 'Key Field Comparison Since Last Accepted Inspection' table.

	Current		Previous		7A07 Required (Y/N)		7A09 Freq	
	Field	Value	Field	Value	Current	Previous	Current	Previous
1A01 Deck:	8	8						
1A02 Substructure:	6	6					24mos	24mos
1A03 Culvert:	N	N					24mos	24mos
1A04 Superstructure:	7	7					60mos	60mos
1A05 Channel:	6	6					-1mos	-1mos
1A06 Waterway:	9	9					24mos	24mos
4A08 Scour Critical:	8	8						
4A09 Structural Eval:	5	5						
4A12 SD Status:	0-ND	2-FO						
4A08b Scour Critical Category:	--	--						

Figure 2.5.2.2-1 Key Field Comparison on the Ratings & Schedule Screen

This view will be open by default when a user clicks on the Ratings and Schedule screen for a structure with a status other than “9 – Accepted” status (Field 1A09).

2.5.3 Agency Inspection

The purpose of this screen is to allow users to view and maintain PennDOT-specific inspection information.

This screen can be accessed in Edit mode by authorized users. Changes to data on this screen are saved to the production BMS2 database.

The screenshot displays the 'INSPECTION - AGENCY INSPECTION' interface. At the top, there is a header with the date '06/06/2018 X - Unknown' and a 'Hide Quick Links' option. Below the header are search and navigation fields: '5A01 SR ID', '5A03 BRKEY', 'Agency ID', and 'Go To: Inspection - Agency Inspection'. The main content area is organized into several sections:

- Inventory Links:** Structure Home, Agency Bridge Features, Structure Units, Drawing Notes, Structure Group.
- Posting:** Inspection Planning, Paint, Design, Risk Assessment Detail.
- Inspection Links:** Ratings & Schedule, Agency Inspection Notes & Comments, Element Condition, Fracture Critical.
- Signing Details:** Safety Features, Load Ratings, Underwater.
- Other Links:** Search Structures, Last Search Results, EDMS Documents, Proposed Maintenance, Completed Maintenance, BP Assignment, Reports, Bulletin Board, Validations, Risk Assessment Search, Last Risk Assessment Search Results, APRAS Data.

The central area contains numerous data entry fields for various inspection metrics, such as '6B01 Spc Insp Type', '6B03 Inventory Correction Ind', '6B05 Deck Overlay Meas Dt', '6B07 Est. Spall Delam %', '6B47 Deck Cracking Metric', '6B10 Est. Spall Chloride %', '6B12 Temperature', '6B14 Deck Geom Appr Tbl', '6B15 Design Excpt', '6B02 New Wear Srf Ind', '6B04 Bump at Bridge Ind', '6B06 Utility Repair Ind', '6B08 Est. Spall Delam Dt', '6B09 Weather', '6B11 Est. Spall Chloride Dt', '6B13 Under Cont Vert', '1A09 Inspection Status', '6B48 Combust. Mat. Under Bridge', and '6B49 Inaccessible Portion of Structure'. Below this are sections for 'Struc Cond/Load Appraisal' (6B16, 6B17, 6B18, 6B19), 'Next Inspection' (6B20, 6B21), 'Inspection Team' (7A02, 6B23, 6B24, 7A05, 6B25), 'Inspection Hrs (Actual)' (6B26, 6B27, 6B28, 6B29, 6B30, 6B31), 'Inspection Cost' (6B32, 6B33, 6B34), 'Paint Info' (6B35, 6B36, 6B37), 'Condition Rating' (6B38, 6B39, 6B40), and 'Sufficiency Information' (6B41, 6B42, 6B43, 6B44, 6B45).

Figure 2.5.3-1 Agency Inspection Screen

This screen includes a direct link to the Inspection Comments screen for each of the condition rating fields. When one of the detailed comments links is clicked, the Inspection Comment List screen is displayed showing only those comments that apply to the corresponding condition rating.

2.5.4 Notes & Comments

2.5.4.1 Comment Lists and Notes

The Inspection Comments List screen allows users to view and maintain inspection comments submitted from iForms. The user is also provided the ability to edit the overall notes for an inspection, corresponding to the Inspection Notes field. When the user edits the overall inspection notes and clicks the Save button, the modified data is saved to the production BMS2 database.

This screen displays two lists of inspection comments, one for structure-level inspection comments and the other for structure unit-level comments. The detailed comment for each of the comment list items cannot be directly edited on this screen – the user must select one of the displayed items and proceed to a corresponding Detail screen to edit data (assuming the user has the necessary security authorization).

In edit mode, the header for each list section contains a Create link. Clicking on the link allows users to create a new structure-level or structure unit-level comment. Each list item also has two links, Edit and Remove, which allow users to view and edit the corresponding comment or remove the comment, respectively.

In view mode, each comment list item includes a single View link to access the corresponding Detail screen.

INSPECTION - COMMENTS 06/06/2018 X - Unknown Hide Quick Links

SA01 SR ID: GO SA03 BRKEY: GO Agency ID: GO Go To: Inspection - Comments GO

Inventory Links	Inspection Links	Other Links
Structure Home Agency Bridge Features Structure Units Drawing Notes Structure Group	Posting Inspection Planning Paint Design Risk Assessment Detail	Ratings & Schedule Agency Inspection Notes & Comments Element Condition Fracture Critical
	Signing Details Safety Features Load Ratings Underwater	Search Structures Last Search Results EDMS Documents Proposed Maintenance Completed Maintenance BP Assignment
		Reports Bulletin Board Validations 0 0 0 0 0 0 Risk Assessment Search Last Risk Assessment Search Results APRAS Data

Inspection Status: 2 - Submitted

Inspection Comments Records 1 to 24 of 24 Records Per Page: 25

IC01 Comment Type	IC02 Comment	Action
1 - Approach Alignment	App Align Notes	View Edit Remove
2 - Appr Road/Pavement	ARC	View Edit Remove
3 - Appr Road/Drainage	Drainage Condition Notes	View Edit Remove
4 - Appr Road/Shoulders	Shoulder Condition Notes	View Edit Remove
5 - Approach Slab	Approach Slab Pavement Notes	View Edit Remove
8 - Transition	Transition Comments	View Edit Remove
9 - Appr Guiderail	AG Comments	View Edit Remove
10 - Appr Rail End	APE Comments	View Edit Remove
11 - Deck Geometry	DG Notes	View Edit Remove
12 - Deck	These are the narrative notes for the deck.	View Edit Remove
13 - Deck Drainage	These are the deck drainage notes.	View Edit Remove
14 - Deck WS	WS Narrative Notes Test	View Edit Remove
15 - Superstructure	These are the general superstructure notes	View Edit Remove
16 - Super/Diaphragms	These are notes on the diaphragms.	View Edit Remove
17 - Super/Portals	No notes on the portals bracings	View Edit Remove
19 - Substructure	These are the substructure notes for ALL subunits.	View Edit Remove
30 - Super/Girders	These are the girder notes.	View Edit Remove
31 - Super/Floorbeams	These are FB notes.	View Edit Remove
36 - Deck Underside	These are the deck underside notes.	View Edit Remove
45 - Channel	These are channel notes	View Edit Remove
46 - Banks	These are banks notes	View Edit Remove
67 - Due To		View Edit Remove
478 - Inspection iForms	test test test test test test test test test	View Edit Remove
480 - Damage Inspection	Does this work?	View Edit Remove

Substructure Comments Records 1 to 30 of 35 Records Per Page: 30

IC03 Substructure Unit	IC04 Comment Type	IC05 Comment	Action
3 - FAB	20 - Abut/Backwall	These are the notes for the backwall for the NAB	View Edit Remove

Figure 2.5.4.1-1 Inspection Comments List Screen

2.5.4.2 Inspection Comment Detail

The Inspection Comment Detail screen allows users to view and maintain detailed structure-level inspection comments.

This screen can be accessed in Edit mode by authorized users. Changes to data on this screen are saved to the production BMS2 database.

The Previous and Next buttons allow the user to display the next or previous structure-level comment in the list. The Save button saves the modified comment to the BMS2 database. The New and Delete buttons are used to add a new structure-level comment or remove the current comment, respectively.

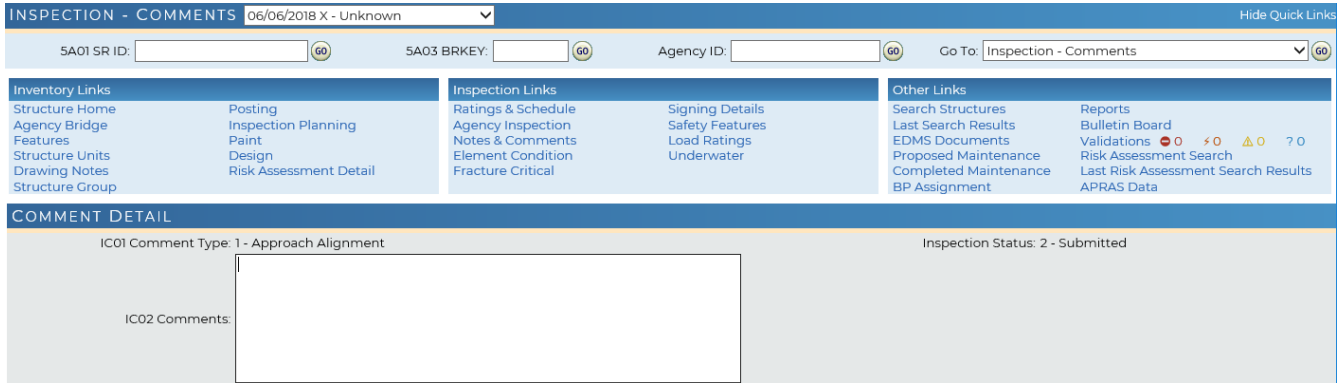


Figure 2.5.4.2-1 Inspection Comment Detail Screen

2.5.4.3 Inspection Structure Unit Comment Detail

The Inspection Structure Unit Comment Detail screen allows users to view and maintain detailed structure unit-level inspection comments.

This screen can be accessed in Edit mode by authorized users. Changes to data on this screen are saved to the production BMS2 database.

The Previous and Next buttons allow the user to display the next or previous structure unit-level comment in the list. The Save button saves the modified comment to the BMS2 database. The New and Delete buttons are used to add a new structure unit-level comment or remove the current comment, respectively.

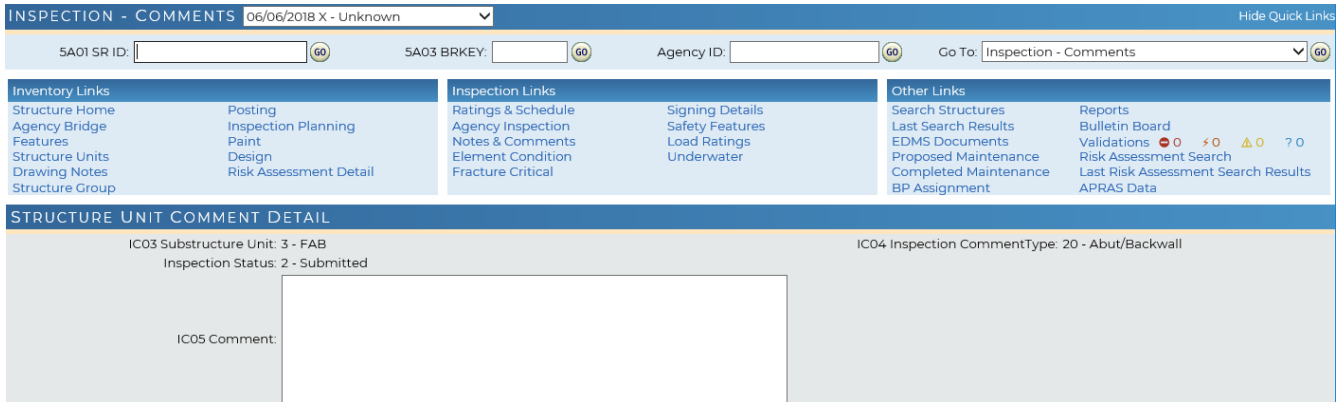


Figure 2.5.4.3-1 Inspection Structure Unit Comment Detail Screen

2.5.5 Element Condition

2.5.5.1 Element List

The Element Condition screen allows users to view and edit the structure elements and condition states for a structure. This screen displays element level condition state ratings.

This screen can be accessed in Edit mode by authorized users. The Save button saves modified fields to the production BMS2 database.

INSPECTION-ELEMENT LIST Hide Quick Links

SA01 SR ID: SA03 BRKEY: Agency ID: Go To:

Inventory Links

- Structure Home
- Agency Bridge
- Features
- Structure Units
- Drawing Notes
- Structure Group

Inspection Links

- Posting
- Inspection Planning
- Paint
- Design
- Risk Assessment Detail

Other Links

- Ratings & Schedule
- Agency Inspection
- Notes & Comments
- Element Condition
- Fracture Critical
- Signing Details
- Safety Features
- Load Ratings
- Underwater

Other Links

- Search Structures
- Last Search Results
- EDMS Documents
- Proposed Maintenance
- Completed Maintenance
- BP Assignment
- Reports
- Bulletin Board
- Validations ● ○ × ▲ ? ○
- Risk Assessment Search
- Last Risk Assessment Search Results
- APRAS Data

Add Element Copy Element Copy Structure Unit

Quantity Percent

NBE Expand All Collapse All Run Validations

Structure Unit ID: Span 1 Type: M - Main Key: 1

Elem	1B01 Element Description	Group/Unit Name	Env	1A10 Qty	UOM	1A11 CS 1 Qty	1A11 CS 2 Qty	1A11 CS 3 Qty	1A11 CS 4 Qty	Action	
12	12-Reinforced Concrete Deck			3	200	sq feet	50	50	50	50	
301	301-Pourable Joint Seal			3	100	feet	100	0	0	0	

Structure Unit ID: Span 2 Type: M - Main Key: 8

Elem	1B01 Element Description	Group/Unit Name	Env	1A10 Qty	UOM	1A11 CS 1 Qty	1A11 CS 2 Qty	1A11 CS 3 Qty	1A11 CS 4 Qty	Action	
13	13-Prestressed Concrete Deck			3	100	sq feet	25	25	25	25	

Summary

Elem	1B01 Element Description	1A10 Qty	UOM	1A11 CS 1 Qty	1A11 CS 2 Qty	1A11 CS 3 Qty	1A11 CS 4 Qty
12	12-Reinforced Concrete Deck	200	sq feet	50	50	50	50
13	13-Prestressed Concrete Deck	100	sq feet	25	25	25	25
301	301-Pourable Joint Seal	100	feet	100	0	0	0

Figure 2.5.5.1-1 Element Condition Screen

2.5.5.2 Element Detail

The Element Detail screen allows users to maintain detail information about the elements of the bridge.

This screen can be accessed in Edit mode by authorized users. Changes to data on this screen are saved to the production BMS2 database.

The Save button saves any modified fields to the BMS2 database. The New button is used to add a new element record.

The screenshot displays the 'INSPECTION-ELEMENT DETAIL' screen. At the top, there is a header with 'INSPECTION-ELEMENT LIST' and a dropdown menu showing '06/06/2018 X - Unknown'. Below this are search fields for 'SA01 SR ID', 'SA03 BRKEY', and 'Agency ID', along with a 'Go To' dropdown set to 'Inspection-Element List'. A navigation menu on the left includes 'Inventory Links', 'Inspection Links', and 'Other Links'. The main content area contains several form fields: '1B01 Element ID' (12-Reinforced Concrete Deck), '1B02 Structure Unit' (Span 1/ Type=M), '1B05 Scale Factor' (input field), '1B07 Element Desc.' (text area), '1B03 Environment' (dropdown set to 'Mod'), '1A10 Quantity/Count' (input field), and '1A12 Elem Cond.' (text area). Below these are radio buttons for 'Quantity' and 'Percent', and four '1A11 CS' quantity fields (1, 2, 3, 4) all set to 50. A 'DEFECTS' section contains a table with columns for 'Elem', 'Applied', 'Qty', 'Scale Factor', 'UOM', and four '1A11 CS' quantity columns. The table lists defects such as '1080-Delamination/ Spall/ Patched Area', '1090-Exposed Rebar', '1120-Efflorescence/ Rust Staining', '1130-Cracking (RC and Other)', '1190-Abrasion/ Wear(PSC/ RC)', and '7000-Damage (Impact Related)'. A 'PROTECTIVE SYSTEMS' section contains a table with columns for 'Elem', 'Applied', 'Qty', 'Scale Factor', 'UOM', and four '1A11 CS' quantity columns, listing '510-Wearing Surfaces'.

Figure 2.5.5.2-1 Element Detail Screen

2.5.6 Load Rating

2.5.6.1 General Information and List

The Load Rating List screen allows users to view and maintain load ratings and rating. By default, this screen displays the load rating data set assigned to the inspection currently being displayed. However, other rating sets can also be displayed by changing the selection in the Calc Date dropdown list. The rating set assigned to the currently-displayed inspection is indicated in the Calc Date dropdown with an asterisk (*).

Note: Only the latest load rating set can be edited; all previous rating sets are display only.

This screen displays the list of load ratings associated with the displayed rating set. The detailed load rating data for each of the list items cannot be directly edited on this screen – the user must select one of the displayed load ratings and proceed to the Load Rating Detail screen to edit data (assuming the user has the necessary security authorization).

In edit mode, the header in the load rating list section contains an Add link. Clicking on the link allows users to create a new load rating for the rating set. Each list item also has two links, Edit and Remove, which allow users to view and edit the corresponding load rating or remove the load rating, respectively.

In view mode, each load rating list item includes a single View link to access the Detail screen.

The screenshot shows the 'INSPECTION - LOAD RATING' interface. At the top, there's a header with the inspection name '06/06/2018 X - Unknown' and a 'Hide Quick Links' option. Below this are search fields for '5A01 SR ID', '5A03 BRKEY', and 'Agency ID', each with a 'GO' button. A 'Go To' dropdown is set to 'Inspection - Load Rating'. The interface is divided into several sections: 'Inventory Links', 'Inspection Links', and 'Other Links', each containing a list of navigation options. Below these are control fields for 'IR01a Load Rating Review Recommended' (checked), 'IR01b Reviewer Action' (set to '0 - Not Reviewed'), 'Due To', 'IR03 Calc Date' (set to '12/05/2016'), 'IR02 Assigned Rating Approval Date', and 'IR02a Assigned Rating Approval Engineer'. The main data area contains a table with columns: 'IR04 Load Type', 'IR05 NBI', 'IR10 Inv Rating ton', 'IR11 Opr Rating ton', 'IR11a SLC Rating ton', 'IR20 IR Rating Factor', 'IR21 OR Rating Factor', 'IR17 Rating Dataset', and 'Action'. The table lists several load types with their corresponding ratings and factors. Below the table are sections for 'NBI Load Ratings' and 'Alternate Load Ratings', each with a list of specific rating items and their details. At the bottom, there's a 'Posting Loads by Truck Type' section with a table showing 'Operating' and 'Inventory' loads for different truck types.

Figure 2.5.6.1-1 Load Rating List Screen

Generate a New Rating Set

An authorized user can create a new load rating set by clicking on New Rating Set button. When the New Rating Set button is clicked, the load ratings for the current displayed rating set are copied to a new rating set and the Calc Date field is open for entry. The user can only enter/change the Calc Date value for a new rating set before the Save button is pressed to save the new rating set to the database. Once the rating set is saved to the database the Calc Date cannot be changed. Once the Save button is pressed, the user can modify the new rating set, if necessary, by using the Create, Edit, and Delete links buttons.

If this screen is accessed for a new structure that does not yet have a rating set, the New Rating Set button creates a single, “empty” load rating detail item to establish the new rating set. The user can then edit the “empty” load rating and/or create new load ratings for the set using the Create and Edit links.

When a new rating set is generated, the corresponding Reviewer Action (stored at the inspection level) is automatically set to 0 – Not Reviewed.

Discard Rating Set

When the user clicks the New Rating set button to create a new rating set the Discard Rating Set button is enabled. The Discard Rating Set button can be used to stop the new rating set process and return the rating set display back to the prior rating set. The Discard Rating Set button is only available until the user presses the Save button for the new rating set- once a new rating set is saved it cannot be deleted.

Assigning a New Rating Set

When the user wishes to assign a new rating set to the current inspection, it can be done by clicking the Assign Rating Set button. However, the new assignment is not committed to the BMS2 database until the Save button is pressed.

2.5.6.2 Load Rating Detail

The Load Rating Detail screen allows users to view and maintain detailed load rating data.

This screen can be accessed in Edit mode by authorized users. Changes to data on this screen are saved to the production BMS2 database.

The Previous and Next buttons allow the user to display the next or previous load rating detail record in the rating set. The Save button saves the modified rating to the BMS2 database. The New and Delete buttons are used to add a new load rating or remove the current load rating from the rating set, respectively.

Only one load rating within a rating set can be designated as the NBI rating. When the IR05 NBI field is set to "1 - NBI Rating" on the Load Rating Detail screen, the NBI rating field for the prior load rating within the current rating set that was designated as the NBI rating is reset to "0 - Not an NBI Rating". This helps to ensure that only a single rating in each rating set is designated as the NBI rating.

The screenshot displays the 'INSPECTION - LOAD RATINGS DETAIL' interface. At the top, there is a navigation bar with the title 'INSPECTION - LOAD RATINGS' and a dropdown menu showing '09/29/2016 C - Routine/crane'. Below this is a search bar with fields for '5A01 SR ID', '5A03 BRKEY', and 'Agency ID', each with a 'GO' button. A 'Go To' dropdown is set to 'Inspection - Load Rating'. The main content area is divided into three sections: 'Inventory Links', 'Inspection Links', and 'Other Links'. The 'Inventory Links' section includes 'Structure Home', 'Agency Bridge', 'Features', 'Structure Units', 'Drawing Notes', and 'Structure Group'. The 'Inspection Links' section includes 'Posting', 'Inspection Planning', 'Paint', 'Design', 'Risk Assessment Detail', 'Ratings & Schedule', 'Agency Inspection', 'Notes & Comments', 'Element Condition', and 'Fracture Critical'. The 'Other Links' section includes 'Search Structures', 'Reports', 'Last Search Results', 'Bulletin Board', 'EDMS Documents', 'Validations', 'Proposed Maintenance', 'Risk Assessment Search', 'Completed Maintenance', 'Last Risk Assessment Search Results', 'BP Assignment', and 'APRAS Data'. Below these links is the 'INSPECTION - LOAD RATINGS DETAIL' form. It contains several input fields: 'IR03 Calc Date' (01/17/2007), 'IR04 Load Type' (dropdown), 'IR05 NBI' (dropdown), 'IR06 Load Rating Meth' (dropdown), 'IR07 Ctrl Memb Type' (dropdown), 'IR08 Fatigue Stress Cat' (dropdown), 'IR09 Fatigue Load Type' (dropdown), 'IR14 AASHTO Man Yr' (text box), 'IR16 Engineer' (text box), 'IR10 Inventory Rating' (text box), 'IR11 Operating Rating' (text box), 'IR11a SLC Rating' (text box), 'IR20 IR Rating Factor' (-1.00), 'IR21 OR Rating Factor' (-1.00), 'IR12 Govern Crit Inv' (dropdown), 'IR13 Govern Crit Opr' (dropdown), 'IR15 AASHTO Spec Yr' (text box), and 'IR18 Stress Range' (text box). At the bottom, there are sections for 'IR17 Rating Dataset' and 'IR19 Notes'.

Figure 2.5.6.2-1 Load Rating Detail Screen

2.5.7 Fracture Critical

2.5.7.1 General Information and List

The Fracture Critical List screen allows users to view and maintain fracture critical inspection data. The screen also displays view-only main and approach span fracture critical inventory information for convenient reference.

The detailed data for the listed fracture critical items cannot be directly edited on this screen – the user must select one of the displayed items and proceed to the Fracture Critical Detail screen to edit data (assuming the user has the necessary security authorization).

In edit mode, the header in the list section contains a Create link. Clicking on the link allows users to create a new fracture critical inspection item. Each list item also has two links, Edit and Remove, which allow users to view and edit the corresponding fracture critical inspection item or remove the item, respectively.

In view mode, each fracture critical inspection item includes a single View link to access the corresponding Detail screen.

IF01 FC Location	IF02 FC Member Type	IF03 FC Member	IF04 Member Detail	Action
8 - 8	01 - Girder	Typical all Girders in Spans 8-41	Fillet weld web-to-flange in tension zone	[View] [Edit] [Remove]
8 - 8	01 - Girder	Typical all Girders in Spans 8-41	Lower Lat. Connection to web in Tension Zones.	[View] [Edit] [Remove]
8 - 8	08 - Cross Girder	Typical all FB's in Spans 8-41.	Fillet weld on top flange of FB at tie-bracket.	[View] [Edit] [Remove]
8 - 8	01 - Girder	Typical all Girders in Spans 8-41.	Trans. Stiff. fillet weld to web in Tension Zone	[View] [Edit] [Remove]
8 - 8	01 - Girder	Typical all Girder Webs Spans 8-41.	Full Pen. Groove Weld Web Splice	[View] [Edit] [Remove]
8 - 8	08 - Cross Girder	Typical all FB's in Spans 8-41.	Catwalk conn. fillet weld to bot. flange of FB's.	[View] [Edit] [Remove]
8 - 8	01 - Girder	Typical all Girder Webs Spans 8-41 in Tension Zones.	Longitudinal / Transverse Stiffener Intersection	[View] [Edit] [Remove]
8 - 8	08 - Cross Girder	Noted Floorbeams in Spans 8-20 NB and SB	Crack in FB web at termination of top flange weld.	[View] [Edit] [Remove]
12 - 12	02 - Sus Hanger	Girders	Base metal at the net section of eyebar head	[View] [Edit] [Remove]

Figure 2.5.7.1-1 Fracture Critical List Screen

2.5.7.2 Fracture Critical Detail

The Fracture Critical Detail screen allows users to view and maintain fracture critical inspection data.

This screen can be accessed in Edit mode by authorized users. Changes to data on this screen are saved to the production BMS2 database.

The Previous and Next buttons allow the user to display the next or previous fracture critical inspection item in the list. The Save button saves the modified data to the BMS2 database. The New and Delete buttons are used to add a new fracture critical inspection item or remove the current inspection item, respectively.

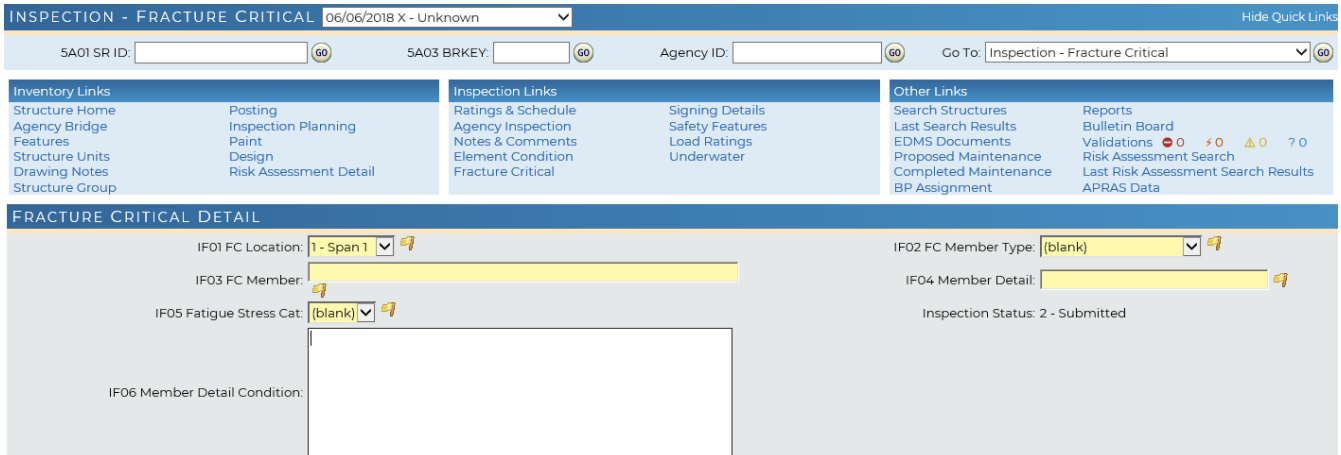


Figure 2.5.7.2-1 Fracture Critical Detail Screen

2.5.8 Underwater

2.5.8.1 General Information and List

The Underwater Inspection screen allows users to view and maintain the detailed data related to an underwater inspection. It also allows inspection reviewers to enter comments and specify an action to be performed by the submitter. The Save button saves the updated reviewer action and comments to the BMS2 database.

INSPECTION - UNDERWATER		06/06/2018 X - Unknown		Hide Quick Links	
SA01 SR ID:	<input type="text"/>	SA03 BRKEY:	<input type="text"/>	Agency ID:	<input type="text"/>
Go To: Inspection - Underwater					
Inventory Links Structure Home Agency Bridge Features Structure Units Drawing Notes Structure Group		Inspection Links Ratings & Schedule Agency Inspection Notes & Comments Element Condition Fracture Critical		Other Links Search Structures Last Search Results EDMS Documents Proposed Maintenance Completed Maintenance BP Assignment	
Posting Inspection Planning Paint Design Risk Assessment Detail		Signing Details Safety Features Load Ratings Underwater		Reports Bulletin Board Validations: 0 0 0 0 Risk Assessment Search Last Risk Assessment Search Results APRAS Data	
IU01 Recalculate SCBI: <input checked="" type="checkbox"/>		IU02 Num Units: <input type="text"/>		1A09 Inspection Status: 2 - Submitted	
7A03 Primary Insp Type: X - Unknown		IU03 SCBI Source: <input type="text"/>		4A08 SCBI: <input type="text"/>	
7A09 Inspection Freq: 98 months		4A08b Scour Critical Category: D			
IU00a UW Reviewer Action: 0 - Not Reviewed			IU00b Reviewer Comments: <input type="text"/>		
SCBI					
IU04 Overall SCBI: 8 <input type="button" value="Calculate"/> IU04b: <input checked="" type="checkbox"/>					
IU06 Stream Bed Material: <input type="text"/> <input type="text"/>					
IU07 Stream Bed Material Desc: <input type="text"/>					
SAR Calculation Data					
IU08 Debris Potential: <input type="text"/>		IU15 US Right WW Presence: <input type="text"/>		IU16 Condition: <input type="text"/>	
IU09 Trapping Potential: <input type="text"/>		IU17 Horiz Debris Start: <input type="text"/>		IU18 Horiz Debris End: <input type="text"/> (0%=LAB to 100%=RAB)	
IU10 Pressure Flow: <input type="text"/>		IU19 Vert Debris Start: <input type="text"/>		IU20 Vert Debris End: <input type="text"/> (0%=Streambed to 100%=Beam)	
IU11 NAB Loc: <input type="text"/>					
IU12 FAB Loc: <input type="text"/>					
IU13 US Left WW Presence: <input type="text"/>					
IU14 Condition: <input type="text"/>					
Current Countermeasures					
Potential Countermeasures					
IU25 Location		IU26 Work Candidate		Action	
UN - Under		11 - C745301-BKFLSCOUR HOLE		<input type="button" value="Save"/> <input type="button" value="Print"/>	

Figure 2.5.8.1-1 Underwater Inspection Screen

The Underwater screen includes direct links to the Inspection Comments screen for the 1A06 Waterway Condition rating and the IL05 Elevation (High Water Mark) fields. When one of the detailed comments links is clicked, the Inspection Comment List screen is displayed showing only those comments that apply to the corresponding condition rating.

2.5.8.2 Underwater Subunit List

The Underwater Subunit List screen allows users to view the list of subunits for a structure related to an underwater inspection. Only substructure units within the 500-year flood plain should be listed on the screen. If the sub-unit is listed on the screen, the required fields on the Sub-Unit Detail screen must be completed.

The screenshot shows the 'INSPECTION - UNDERWATER' interface. At the top, there are search filters for '06/06/2018 X - Unknown' and 'Inspection - Underwater'. Below this are three columns of links: 'Inventory Links', 'Inspection Links', and 'Other Links'. A status bar shows '1A09 Inspection Status: 2 - Submitted' and '7A03 Primary Insp Type: X - Unknown'. Below the status bar are tabs for 'SCBI', 'Sub Units', and 'Other'. The main table, titled 'Subunits', contains the following data:

IN01 Sub Unit	IN03 Scour Rating	IN13 INV Found Type	IN18 Water Depth	IU27 SCBI CODE	IU28 SCBI CASE	Action
FAB	5 - Advanced scour	A - competent bedrock	66.7	8	2	[edit] [delete]
NAB	5 - Advanced scour	A - competent bedrock	90.0	8	2	[edit] [delete]
PO1	5 - Advanced scour	A - competent bedrock	0.0	8	2	[edit] [delete]
PO2	5 - Advanced scour	A - competent bedrock	-1.0	8	2	[edit] [delete]
PO3	5 - Advanced scour	A - competent bedrock	-1.0	8	2	[edit] [delete]

Figure 2.5.8.2-1 Underwater Subunit List Screen

2.5.8.3 Underwater Subunit Details

The Underwater Subunit Details screen allows users to view and edit the detailed underwater inspection data related to a subunit as recorded or verified during an underwater inspection. The Previous and Next buttons allow the user to display the next or previous subunit inspection item in the list. There are no other screen-specific buttons available on this screen.

The screenshot displays the 'INSPECTION - UNDERWATER' interface. At the top, there are search fields for 'SA01 SR ID', 'SA03 BRKEY', and 'Agency ID', along with a 'Go To' dropdown menu set to 'Inspection - Underwater'. Below this is a navigation bar with three sections: 'Inventory Links', 'Inspection Links', and 'Other Links'. The 'Inventory Links' section includes 'Structure Home', 'Agency Bridge', 'Features', 'Structure Units', 'Drawing Notes', and 'Structure Group'. The 'Inspection Links' section includes 'Posting', 'Inspection Planning', 'Paint', 'Design', and 'Risk Assessment Detail'. The 'Other Links' section includes 'Search Structures', 'Last Search Results', 'EDMS Documents', 'Proposed Maintenance', 'Completed Maintenance', 'BP Assignment', 'Reports', 'Bulletin Board', 'Validations', 'Risk Assessment Search', 'Last Risk Assessment Search Results', and 'APRAS Data'. The main content area is titled 'SUB UNIT DETAIL' and contains two columns of inspection data. The left column includes parameters IN01 through IN11, all with dropdown menus showing '[blank]'. The right column includes parameters IN12 through IN23, with dropdown menus for IN12, IN13, and IN16, and text input fields for IN17, IN18, IN22, and IN23. A large text area for 'IN24 Notes' is located at the bottom of the main content area.

Figure 2.5.8.3-1 Underwater Subunit Details Screen

2.5.8.4 Underwater Other Details Screen

The Underwater Other Details screen allows users to view and edit the other underwater inspection data such as high water notes and underclearances.

The screenshot displays the 'INSPECTION - UNDERWATER' interface. At the top, there is a header with the title and a dropdown menu showing '06/06/2018 X - Unknown'. Below this are search fields for 'SA01 SR ID', 'SA03 BRKEY', and 'Agency ID', each with a magnifying glass icon. A 'Go To' dropdown is set to 'Inspection - Underwater'. The main content area is divided into three columns of links: 'Inventory Links' (Structure Home, Agency Bridge, Features, Structure Units, Drawing Notes, Structure Group), 'Inspection Links' (Ratings & Schedule, Agency Inspection, Element Condition, Fracture Critical), and 'Other Links' (Search Structures, Last Search Results, EDMS Documents, Proposed Maintenance, Completed Maintenance, BP Assignment, Reports, Bulletin Board, Validations, Risk Assessment Search, Last Risk Assessment Search Results, APRAS Data). Below the links are several data fields: '1A09 Inspection Status: 2 - Submitted', '7A03 Primary Insp Type: X - Unknown', 'IU01 Recalculate SCBI: [checked]', 'IU03 SCBI Source: [blank]', 'IU02 Num Units: [blank]', and '4A08 SCBI: [blank]'. There are also tabs for 'SCBI', 'Sub Units', and 'Other'. The 'Structure Level Data' section includes '1A06 Waterway: 8', 'IL02 Risk of Overtopping: [blank]', 'IL03 Traffic Delay: [blank]', 'IL04 Func Class: 17 - Urban Collector', 'IL13 Worst Flood Event: [blank]', and 'IL14 Worst Flood Event Date: [calendar icon]'. The 'High Water Mark' section has 'IL05 Elevation: [input]', 'IL06 Date: [calendar icon]', and 'IL07 New High Water: [blank]'. Below this is a text area for 'IL08 High Water Notes:'. The 'Underclearance' section is a table with columns for 'IL09 Origin Desc', 'IL10 Horiz. ft', 'IL11 Vert. ft', 'IL12 Notes', and 'Action'. The table contains one row with 'IL09 Notes', '-1.0', '-1.0', 'IL12 Notes', and an edit/delete icon.

IL09 Origin Desc	IL10 Horiz. ft	IL11 Vert. ft	IL12 Notes	Action
IL09 Notes	-1.0	-1.0	IL12 Notes	[edit] [delete]

Figure 2.5.8.4-1 Underwater Other Details Screen

2.5.9 Inspection - Signs & Lights

The purpose of this screen is to allow users to view and maintain basic inspection condition and schedule data for a sign or light structure. This screen displays component level condition ratings, and other rating and inspection scheduling information for the structure.

This screen can be accessed in Edit mode by authorized users. The Save button saves modified fields to the production BMS2 database.

Figure 2.5.9-1 Signs & Lights Inspection Screen

This screen includes a direct link to the Inspection Comments screen for each of the condition rating fields. When one of the detailed comments links is clicked, the Inspection Comment List screen is displayed showing only those comments that apply to the corresponding condition rating.

2.5.10 Inspection – Walls

The purpose of this screen to is to allow users to view and maintain basic inspection condition and schedule data for a wall structure. This screen displays component level condition ratings, and other rating and inspection scheduling information for the structure.

This screen can be accessed in Edit mode by authorized users. The Save button saves modified fields to the production BMS2 database.

Figure 2.5.10-1 Walls Inspection Screen


This screen includes a direct link to the Inspection Comments screen for each of the condition rating fields. When one of the detailed comments links is clicked, the Inspection Comment List screen is displayed showing only those comments that apply to the corresponding condition rating.

2.5.11 Signing Details

2.5.11.1 Signing Lists and Notes

The Signing Detail screen allows users to view and maintain signing comments submitted from *iForms*. When the user edits the signing details and clicks the Save button, the modified data is saved to the production BMS2 database.

This screen displays the ten types of signs shown in *iForms*, if the sign is needed and the sign message. The detailed signing information for each of the type of sign cannot be directly edited on this screen – the user must select one of the displayed items and proceed to a corresponding Signing Detail screen to edit data (assuming the user has the necessary security authorization).

In edit mode, the header for the signing section contains a new sign link . Clicking on the link allows users to create a new signing type. Each list item also has two links, Edit and Remove, which allow users to view and edit the corresponding comment or remove the comment, respectively.

In view mode, each comment list item includes a single View link to access the corresponding Detail screen.






















INSPECTION - SIGNINGS 06/06/2018 X - Unknown Hide Quick Links							
SA01 SR ID: <input type="text"/>		SA03 BRKEY: <input type="text"/>		Agency ID: <input type="text"/>		Go To: Inspection - Signings	
Inventory Links		Inspection Links		Other Links			
Structure Home		Ratings & Schedule		Search Structures			
Agency Bridge		Agency Inspection		Last Search Results			
Features		Notes & Comments		EDMS Documents			
Structure Units		Element Condition		Proposed Maintenance			
Drawing Notes		Fracture Critical		Completed Maintenance			
Structure Group				BP Assignment			
Posting		Signing Details		Reports			
Inspection Planning		Safety Features		Bulletin Board			
Paint		Load Ratings		Validations 0 0 0 0			
Design		Underwater		Risk Assessment Search			
Risk Assessment Detail				Last Risk Assessment Search Results			
				APRAS Data			
Signings 							
ID01 Type of Sign	ID02 Sign Needed?	ID03 Sign Message	ID04 Near Advance	ID05 Far Advance	ID06 Bridge Site Near	ID07 Bridge Site Far	Action
0 - Bridge	0 - sign not needed	Bridge	G - Good	G - Good	G - Good	M - Missing	 
1 - Bridge Weight	0 - sign not needed	Weight	D - Damaged		G - Good	N - Not Applicable	 
2 - Except Comb	0 - sign not needed	Except	G - Good	D - Damaged	D - Damaged	G - Good	 
3 - One Truck	0 - sign not needed	One Truck	M - Missing	G - Good	D - Damaged	G - Good	 
4 - Vert Clearance On	0 - sign not needed	Vert Cl On	N - Not Applicable	M - Missing	G - Good	D - Damaged	 
5 - Vert Clearance Under	0 - sign not needed	Vert Cl Un	D - Damaged	N - Not Applicable	M - Missing	D - Damaged	 
6 - One Lane Bridge	0 - sign not needed	OLB					 
7 - Narrow Bridge	0 - sign not needed	NB	M - Missing	G - Good	D - Damaged	M - Missing	 
8 - Hazardous Clearance	0 - sign not needed	Haz Cl	N - Not Applicable	M - Missing	G - Good	M - Missing	 
9 - Other	0 - sign not needed	Other	G - Good	N - Not Applicable	N - Not Applicable	N - Not Applicable	 

Figure 2.5.11.1-1 Signings Screen

2.5.11.2 Signing Detail Comment Detail

The Signing Detail screen allows users to view and maintain detailed types, locations and comments.

This screen can be accessed in Edit mode by authorized users. Changes to data on this screen are saved to the production BMS2 database.

The Previous and Next buttons allow the user to display the next or previous signing detail in the list. The Save button saves the modified comment to the BMS2 database. The New and Delete buttons are used to add a new structure-level comment or remove the current comment, respectively. The Previous and Next buttons allow the user to display the next or previous subunit inspection item in the list.

INSPECTION - SIGNINGS 06/06/2018 X - Unknown Hide Quick Links

SA01 SR ID: [] GO SA03 BRKEY: [] GO Agency ID: [] GO Go To: Inspection - Signings GO

Inventory Links
Structure Home
Agency Bridge
Features
Structure Units
Drawing Notes
Structure Group

Posting
Inspection Planning
Paint
Design
Risk Assessment Detail

Inspection Links
Ratings & Schedule
Agency Inspection
Notes & Comments
Element Condition
Fracture Critical

Signing Details
Safety Features
Load Ratings
Underwater

Other Links
Search Structures
Last Search Results
EDMS Documents
Proposed Maintenance
Completed Maintenance
BP Assignment
Reports
Bulletin Board
Validations 0 0 0 0
Risk Assessment Search
Last Risk Assessment Search Results
APRAS Data

SIGNING DETAIL

ID01 Type of Sign: (blank) [v] [?]

ID02 Sign Needed?: (blank) [v] [?]

ID03 Sign Message: []

ID04 Near Advance: [v]

ID05 Far Advance: [v]

ID06 Bridge Site Near: [v]

ID07 Bridge Site Far: [v]

ID08 Notes: []

Figure 2.5.11.2-1 Signing Detail Screen

2.5.12 Safety Features

2.5.12.1 Safety Features List

The Safety Features screen allows users to view and maintain safety feature comments submitted from iForms. When the user edits the safety features details and clicks the Save button, the modified data is saved to the production BMS2 database.

This screen displays the four safety features types, controlling location, adequacy rating and description of the feature. The detailed safety feature information for each of the type of sign cannot be directly edited on this screen – the user must select one of the displayed items and proceed to a corresponding safety feature screen to edit data (assuming the user has the necessary security authorization).

Each list item also has an Edit link, which allow users to view and edit the corresponding comment or remove the comment, respectively. The Previous and Next buttons allow the user to display the next or previous subunit inspection item in the list.

In view mode, each comment list item includes a single View link to access the corresponding Detail screen.

Feature	IA01 Location	IA02 Adequacy	IA03 Description	Action
1 - Railing	1 - Left	8 - good cond/meets stds	Railing Description	View
2 - Transition	2 - Right	6 - adeq/not standard	Transition Description	View
3 - Approach Guiderail	3 - Near Left	4 - does not meet code 6	App Guide Description	View
4 - Approach railend	5 - Far Left	2 - Req not provided	Railend Description	View

Figure 2.5.12.1-1 Safety Feature Screen

2.5.12.2 Safety Feature Comment Detail

The Safety Feature Detail screen allows users to view and maintain detailed information about the safety feature. This screen can be accessed in Edit mode by authorized users. Changes to data on this screen are saved to the production BMS2 database.

The Previous and Next buttons allow the user to display the next or previous signing detail in the list. The Save button saves the modified comment to the BMS2 database. The New and Delete buttons are used to add a new structure-level comment or remove the current comment, respectively.

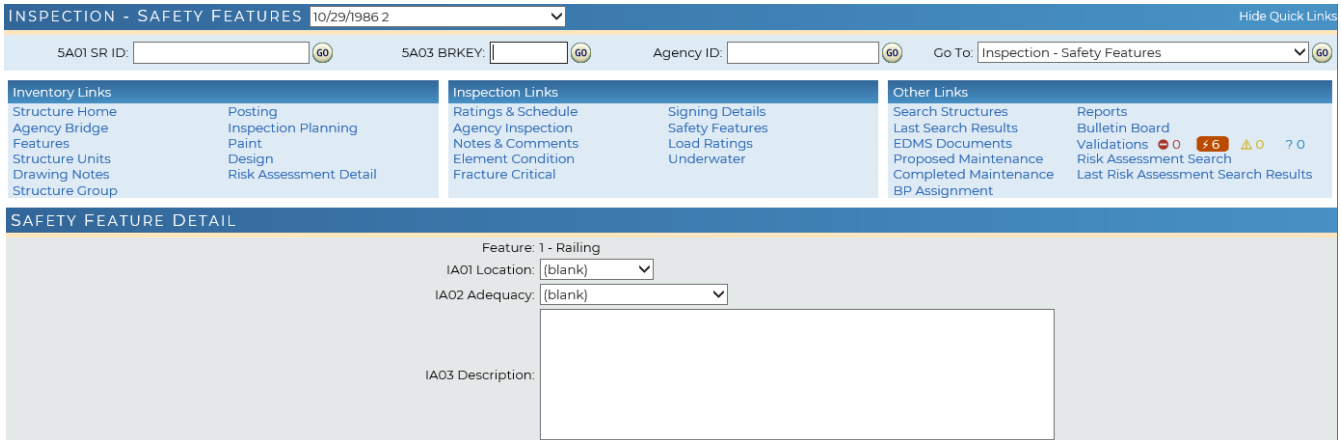


Figure 2.5.12.2-1 Safety Feature Screen

2.6 Bridge-Related EDMS Documents

2.6.1 EDMS Document List

The EDMS Document List screen provides users with a list of electronic documents stored in the PennDOT Electronic Document Management System (EDMS) that have been linked to or uploaded for the current structure. From this list the user can choose to view existing documents, remove documents or add additional documents to the list.

This screen presents separate scrollable lists of inventory-level and inspection-level documents associated with the current structure. For a document to appear on one of these lists it must

- Exist in EDMS
- Be linked to the structure in BMS2 either by being uploaded from the BMS2 Web Upload EDMS Document screen or “linked” to the structure using the Link EDMS Documents screen.

The Source field displayed for each listed document indicates whether the document was uploaded from BMS2 or whether it was loaded into EDMS before being linked to BMS2.

Note: There may be an initial conversion and linking of existing EDMS documents to corresponding structures in BMS2. However, in general a structure-related document directly loaded into EDMS will not be linked to a structure unless the user manually creates the link using the BMS2 Web Link EDMS Documents screen.

OTHER - STRUCTURE EDMS DOCUMENT LIST Hide Quick Links

SA01 SR ID: GO SA03 BRKEY: GO Agency ID: GO Go To: Other - Structure EDMS Document List GO

Inventory Links
 Structure Home
 Agency Bridge
 Features
 Structure Units
 Drawing Notes
 Structure Group

Posting
 Inspection Planning
 Paint
 Design
 Risk Assessment Detail

Inspection Links
 Ratings & Schedule
 Agency Inspection
 Notes & Comments
 Element Condition
 Fracture Critical

Signing Details
 Safety Features
 Load Ratings
 Underwater

Other Links
 Search Structures
 Last Search Results
 EDMS Documents
 Proposed Maintenance
 Completed Maintenance
 BP Assignment

Reports
 Bulletin Board
 Validations: 0 0 0 0 0 0
 Risk Assessment Search
 Last Risk Assessment Search Results
 APRAS Data

Link Project Documents

Inventory
 Records 1 to 7 of 7

Document Type	Document Label/Description	Last Modified Date	Source	Action
BMS Inspection Data	Test ECC Implementation 3/4/2014	03/04/2014	BMS	View Edit Delete
Alternative Bridge Structure	Testing upload to EDMS - June-9			View Edit Delete
Inspection Photo				View Edit Delete
Inspection Photo		05/17/2015	EDMS	View Edit Delete
Inspection Photo		05/17/2015	EDMS	View Edit Delete
Inspection Photo	Test Grouping Docs	09/21/2015	EDMS	View Edit Delete
BMS Documents		09/21/2015	BMS	View Edit Delete

Inspection
 Records 1 to 9 of 9

Inspection Date	Document Type	Document Label/Description	Last Modified Date	Source	Action
11/14/2017	D-450 / D-488 Inspection Report	TCS 12918	01/29/2018	BMS	View Edit Delete
12/23/2016	Inspection Manuals	Test Upload Doc - 4-10	04/10/2017	BMS	View Edit Delete
03/24/2014	Inspection Manuals	Upload test	05/02/2018	BMS	View Edit Delete
01/09/2013	BMS Documents	UREDMS release Upload test - 05/30/2015	05/02/2018	BMS	View Edit Delete
01/09/2013	BMS Inspection Data	Test new from BMS	07/20/2013	BMS	View Edit Delete
01/09/2013	BMS Inspection Data	UREDMS upload test2 - may 30 2015	05/30/2015	BMS	View Edit Delete
01/09/2013	D-450 / D-488 Inspection Report	ANOTHER TEST DOCUMENT 072013	07/20/2013	BMS	View Edit Delete
01/09/2013	D-450 / D-488 Inspection Report	TEST DOCUMENT	07/12/2013	BMS	View Edit Delete
01/09/2013	Value Engineering	Test Value Engineering	09/29/2014	BMS	View Edit Delete

Figure 2.6.1-1 EDMS Document List Screen

The View link allows users to view the actual document as retrieved from EDMS. Documents accessed using the View link are displayed using an existing application on the client machine, invoked based on file association (e.g., a PDF file may open in Adobe Acrobat Reader). The display of the documents is completely dependent upon the file associations – no specific document viewer is provided via BMS2 Web.

The Edit link allows users to update certain BMS2 properties of the link, such as the document description or the inspection date. Only specific property fields for the linked file can be edited – the user cannot edit the actual EDMS document itself or change the linked EDMS document.

The Delete link deletes the document link from BMS2. The Remove link does not delete the document itself in EDMS – only the link to the specific structure in BMS2 is removed.

In view-only mode, each listed document item only includes a single View link to access the document.

Back Upload Link Help

OTHER - STRUCTURE EDMS DOCUMENT LIST Hide Quick Link

SA01 SR ID: (GO) SA03 BRKEY: (GO) Agency ID: (GO) Go To: Other - Structure EDMS Document List (GO)

Inventory Links	Posting Inspection Planning Paint Design Risk Assessment Detail	Inspection Links	Ratings & Schedule Agency Inspection Notes & Comments Element Condition Fracture Critical	Signing Details Safety Features Load Ratings Underwater	Other Links	Search Structures Last Search Results EDMS Documents Proposed Maintenance Completed Maintenance BP Assignment	Reports Bulletin Board Validations 0 0 0 0 0 0 Risk Assessment Search Last Risk Assessment Search Results APRAS Data
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[Link Project Documents](#)

Inventory
Records 1 to 7 of 7

Document Type	Document Label/Description	Last Modified Date	Source	Action
BMS Inspection Data	Test ECC Implementation 3/4/2014	03/04/2014	BMS	
Alternative Bridge Structure	Testing upload to EDMS - June-9	05/02/2018	BMS	
Inspection Photo		05/17/2015	EDMS	
Inspection Photo		05/17/2015	EDMS	
Inspection Photo		05/17/2015	EDMS	
Inspection Photo	Test Grouping Docs	09/21/2015	EDMS	
BMS Documents		09/21/2015	BMS	

Inspection
Records 1 to 9 of 9

Inspection Date	Document Type	Document Label/Description	Last Modified Date	Source	Action
11/14/2017	D-450 / D-488 Inspection Report	TCS 12918	01/29/2018	BMS	
12/23/2016	Inspection Manuals	Test Upload Doc - 4-10	04/10/2017	BMS	
03/24/2014	Inspection Manuals	Uploaded test	05/02/2018	BMS	
01/09/2015	BMS Documents	UPREEDMS release Upload test - 05/30/2015	05/02/2018	BMS	
01/09/2015	BMS Inspection Data	Test new from BMS	07/20/2013	BMS	
01/09/2013	BMS Inspection Data	UREDMS upload test2 - may 30 2015	05/30/2015	BMS	
01/09/2013	D-450 / D-488 Inspection Report	ANOTHER TEST DOCUMENT 072013	07/20/2013	BMS	
01/09/2013	D-450 / D-488 Inspection Report	TEST DOCUMENT	07/12/2013	BMS	
01/09/2013	Value Engineering	Test Value Engineering	09/29/2014	BMS	

Figure 2.6.1-2 Link and Upload Buttons

The screen also includes Upload and Link buttons. The Upload button allows users to navigate to the Upload EDMS Document screen where they can upload a document from a local drive to EDMS and associate the uploaded document with a specific structure and/or inspection in BMS2. The Link button allows users to navigate to the Link EDMS Documents screen where users can associate a document that already exists in EDMS with a specific structure or inspection.

The Upload and Link buttons are not displayed in view-only mode.

2.6.2 EDMS Document Upload

The EDMS Document Upload screen provides users a mechanism to upload documents to EDMS from the user's local machine and establish an association or "link" to a specific BMS2 structure or inspection.

Figure 2.6.2-1 EDMS Document Upload Screen

This detail screen presents the information necessary to upload a document to EDMS and establish a link to a BMS2 structure. To upload a document into EDMS and create a BMS2 link the user must:

1. Select a Document Type from a pre-defined list of structure-related EDMS document types. The selected document type is then used to create the document in EDMS.
2. (Optional) Enter a BMS2 label unique to the document. This is especially helpful if there are multiple documents of the same type for a specific structure because the label can be used to distinguish the documents without having to open up each one individually to view the content.
3. (Optional) Select the appropriate Inspection (Date) if the document is to be linked to a specific inspection rather than just the structure itself.
4. Enter or select the location of the file to be uploaded. The Document Location field allows the user to specify the location on the user's local machine of the document to be uploaded. The Browse button can be used to navigate the folder structure on the local machine to locate the file to be uploaded.
5. Click the Upload button.

When the Upload button is clicked, the document is transferred from the local machine to the server and deposited into EDMS along with the necessary EDMS key values. A record is also created in BMS2 that identifies the linked document and stores the label and specific document identifier generated in EDMS. The document then appears on the EDMS Document List screen.

2.6.2.1 Edit Uploaded EDMS Document

The Edit Uploaded EDMS Document screen is similar to the upload screen, and provides users a mechanism to view and update certain properties of a document previously uploaded for a structure/inspection in BMS2.

For an uploaded document, only the Document Label and Inspection fields can be edited. Updated data values are saved only within the BMS2 database. The user cannot change the linked EDMS document. If the user wishes to change the linked EDMS document, they must remove the link (using the Remove link on the EDMS Document List screen) and then upload or link to a new document. Removing the link does not remove the document from EDMS.

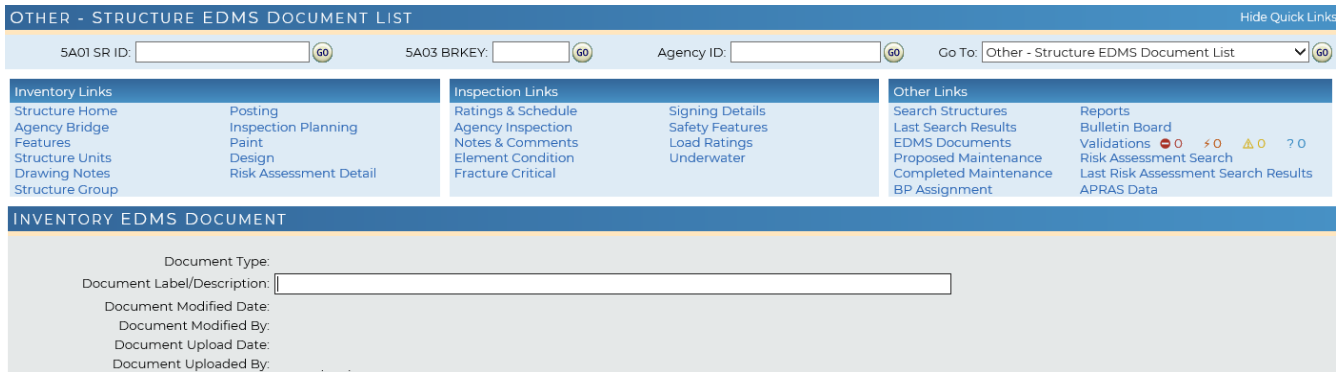


Figure 2.6.2.1-1 Edit Uploaded EDMS Document Screen

2.6.3 Link EDMS Document

The Link EDMS Document screen provides users a mechanism to link a structure or structure inspection to a document that already exists in EDMS. It serves a similar function to the Upload EDMS Document screen except the document itself is not uploaded. In order for a document to appear for selection/linking, the BRKEY and/or Structure ID for the current structure must have been entered as the structure identifier when the document was created in EDMS.

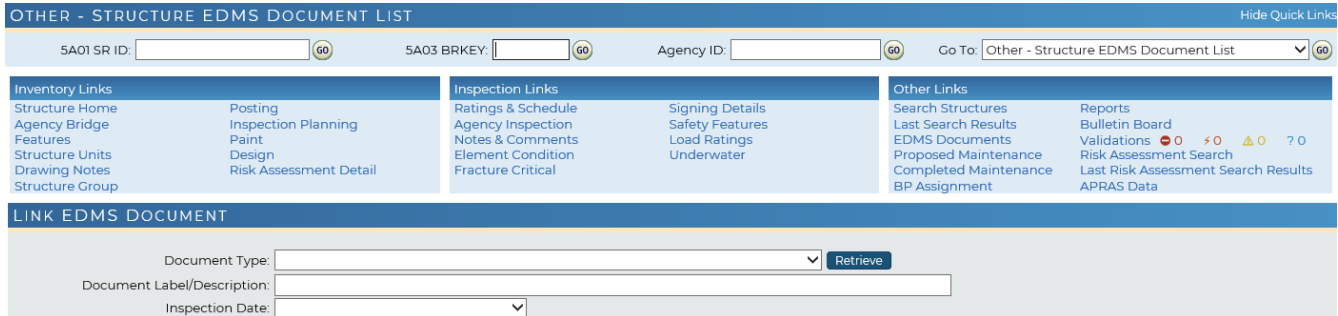


Figure 2.6.3-1 Link EDMS Document Screen

The screen presents fields necessary to establish a link with one or more EDMS documents. To create a BMS2 link to an existing document(s) in EDMS the user must:

1. Retrieve the list of documents in EDMS that are associated with the current structure. The user must specify the Document Type for which the system should search by selecting it in the Document Type dropdown list.
2. Click the Retrieve button. The system then retrieves a list of all EDMS documents of the selected type associated with the current structure. The list shows all documents of the selected type that are in EDMS for the current structure, but indicates those documents that are already linked to the structure/inspection.
3. To select the document to be linked, the user must click the checkbox for that record. The user may choose one or more documents for a particular document link (e.g., one or more pages of a structure plan).

When the link process is complete, the user is returned to the EDMS Document List screen, which now lists the linked document with the date the link was established.

2.6.4 Link Project Document

The Link Project Document screen provides users a mechanism to link documents from ECMS and MPMS projects into BMS2 EDMS. In order for a document to appear for selection/linking, the user must click the “Link Project Documents” button and enter the ECMS or MPMS number. All available documents will be linked.

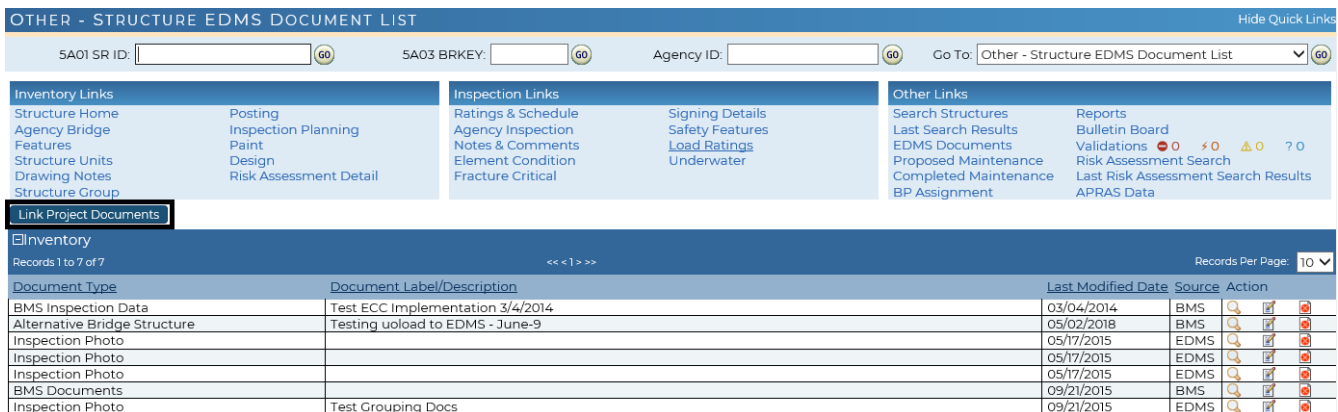


Figure 2.6.4-1 Link Project Documents

2.7 Maintenance

2.7.1 Proposed Maintenance List Screen

To view the proposed maintenance for a particular structure, click on the Proposed Maintenance link in the Quick Links - Other Links section on any structure screen. This can be done either by an authorized PennDOT user or by a business partner user whose organization has been defined as an Owner or Owner agent for the current structure.

After clicking the link the Proposed Maintenance screen is displayed for the current structure. The New and Delete buttons are used to add a new proposed maintenance item or remove the current comment, respectively. To view completed maintenance items on the Proposed Maintenance screen, simply check the box next to "Show Completed Work Candidates". The screen will update and show the completed maintenance items beneath the proposed.

OTHER - MAINTENANCE - PROPOSED MAINTENANCE Hide Quick Links

SA01 SR ID:
 SA03 BRKEY:
 Agency ID:
 Go To: Other - Maintenance - Proposed Maintenance

Inventory Links
[Structure Home](#)
[Agency Bridge](#)
[Features](#)
[Structure Units](#)
[Drawing Notes](#)
[Structure Group](#)

Posting
[Inspection Planning](#)
[Paint](#)
[Design](#)
[Risk Assessment Detail](#)

Inspection Links
[Ratings & Schedule](#)
[Agency Inspection](#)
[Notes & Comments](#)
[Element Condition](#)
[Fracture Critical](#)

Signing Details
[Safety Features](#)
[Load Ratings](#)
[Underwater](#)

Other Links
[Search Structures](#)
[Last Search Results](#)
[EDMS Documents](#)
[Proposed Maintenance](#)
[Completed Maintenance](#)
[BP Assignment](#)

Reports
[Bulletin Board](#)
[Validations](#) ● ● ● ● ●
[Risk Assessment Search](#)
[Last Risk Assessment Search Results](#)
[APRAS Data](#)

NBI Project Data

3B01 Proposed Deck/Super Work:
 3B02 Proposed Sub Work:
 3B03 Improvement Length: ft

 3B04 Improvement Cost: (in thousands)
 3B05 Roadway Improvement Cost: (in thousands)
 3B06 Total Cost: (in thousands)
 3B07 Year of Estimate:

Work Candidates

Items highlighted in yellow have been submitted to SAP Show Completed Work Candidates

Proposed Maintenance Records Per Page: 5

#	3A02 Work Candidate ID	IM02 Element	IM03 Action	IM05 Priority	IM06 Date Recom	IM07 Status	Action
1	MA-4775-0-1B0223145309539	N/A	96-CombustOnSiteReview	2 - Priority	02/28/2018	1 - Work planned/Dept	<input type="button" value="E"/> <input type="button" value="D"/>
2	IFORMS-2018-29-DDCO-7X-SO-2301	N/A	2-A743301-RESEAL DK JOINT	5 - Routine Non-Struc	11/14/2017	0 - Work not planned	<input type="button" value="E"/> <input type="button" value="D"/>

Figure 2.7.1-1 Proposed Maintenance List Screen

2.7.2 Proposed Maintenance Detail Screen

The Proposed Maintenance Detail screen allows users to view and maintain detailed structure-level proposed maintenance items.

This screen can be accessed in Edit mode by authorized users. Changes to data on this screen are saved to the production BMS2 database.

The Save button saves the modified comment to the BMS2 database.

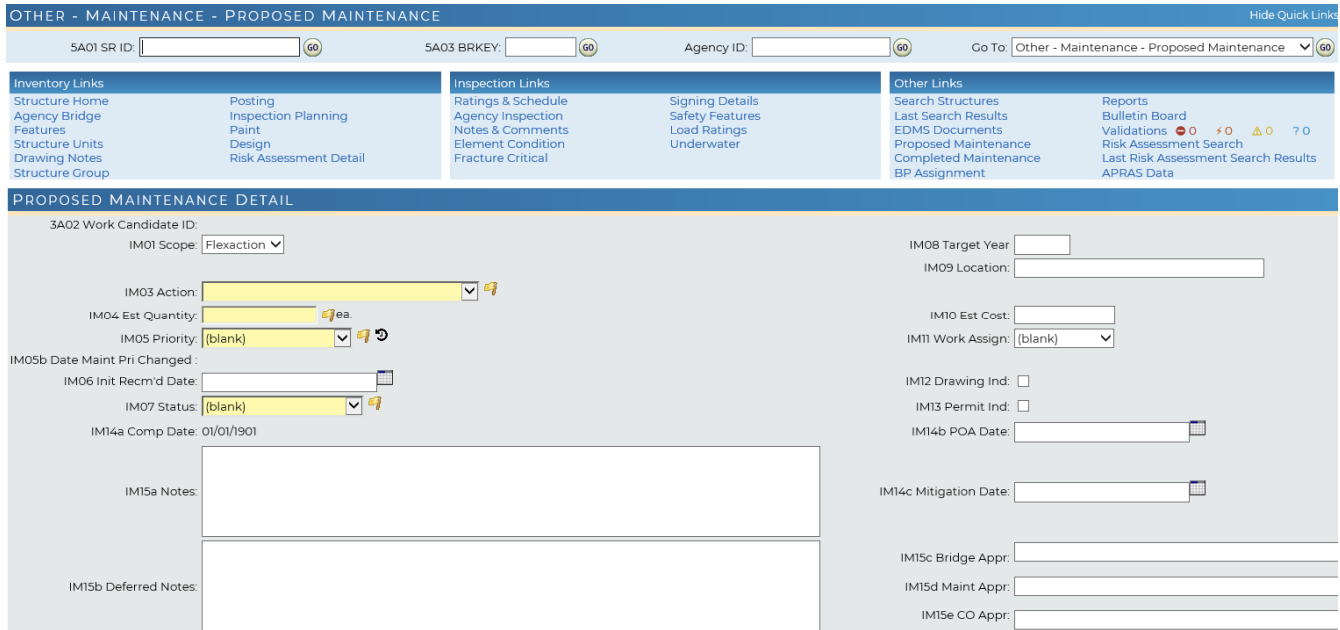


Figure 2.7.2-1 Proposed Maintenance Detail Screen

2.7.3 Sending Proposed Bridge Maintenance Activities to SAP

All proposed work items (bridge, element and flexible actions) will be listed on the Proposed Maintenance screen. The Proposed Maintenance screen allows users to view work activities and track their status. Districts may also create work notifications in SAP for county maintenance crews on this screen by following a series of simple steps. This new function in BMS2 supplies SAP with minimum information to initiate the notification which then becomes a work order after further review and approval. After the bridge maintenance work is completed and the information is updated in SAP, BMS2 retrieves select information from SAP and stores it on the Completed work tab.

Once the District Bridge Maintenance Coordinators and County Maintenance crews have decided on which bridge maintenance activities are to be worked on in the upcoming year, the Bridge Maintenance Coordinators may then create notifications for SAP through BMS2 by doing the following:

1. Navigate to the Proposed Maintenance screen for the desired bridge.
2. Select the desired maintenance activity that is to be sent to SAP.
3. Set Item IM07, Status, to "1 - Work planned/Dept"
4. Set Item IM08, Target Year, to the applicable year.
5. Set Item IM11, Work Assign, to "0 - Agency".
6. Save the changes
7. Ensure that the maintenance activity is highlighted and Click on the "Submit to SAP" button. Item IM07, Status, will change to "3 - Work Sent to SAP" the next day after successful submission to SAP.

2.7.4 Completed Maintenance List Screen

To view the completed maintenance for a particular structure, click on the Completed Maintenance link in the Quick Links - Other Links section on any structure screen. This can be done either by an authorized PennDOT user or by a business partner user whose organization has been defined as an Owner or Owner agent for the current structure.

After clicking the link the Completed Maintenance screen is displayed for the current structure.

OTHER - MAINTENANCE - COMPLETED MAINTENANCE								Hide Quick Links
5A01 SR ID: <input type="text"/>		5A03 BRKEY: <input type="text"/>		Agency ID: <input type="text"/>		Go To: Other - Maintenance - Completed Maintenance		
Inventory Links Structure Home Agency Bridge Features Structure Units Drawing Notes Structure Group		Inspection Links Ratings & Schedule Agency Inspection Notes & Comments Element Condition Fracture Critical		Other Links Search Structures Last Search Results EDMS Documents Proposed Maintenance Completed Maintenance BP Assignment		Reports Bulletin Board Validations 0 0 0 0 Risk Assessment Search Last Risk Assessment Search Results APRAS Data		
Records 1 to 4 of 4								Records Per Page: 5
3A02 Work Candidate ID	IM01 Scope	IM02 Element	IM03 Action	IM05 Priority	IM07 Status	IM14a Comp Date	Action	
MA-4775-1-160615084805485	FLEXACTION	N/A	11-C745301-BKFL SCOUR HOLE	1 - High	7 - Superseded	06/15/2016		
IFORMS-2017-4-1NBC-J3-BI-72628	FLEXACTION	N/A	1-B743101-FLUSH SCUP/DNSPTG	2 - Priority	6 - Completed/Contr	01/01/1901		
MA-4775-2-1801291735333533	FLEXACTION	N/A	101-Repair Wearing Surface	3 - Add to Schedule	6 - Completed/Contr	01/01/1901		
MA-4775-3-1802231455185518	FLEXACTION	N/A	F-97	2 - Priority	7 - Superseded	01/01/1901		

Figure 2.7.4-1 Completed Maintenance Screen

2.7.5 Completed Maintenance Detail Screen

The Completed Maintenance Detail screen allows users to view and maintain detailed structure-level completed maintenance items.

This screen is read only and cannot be edited by users.

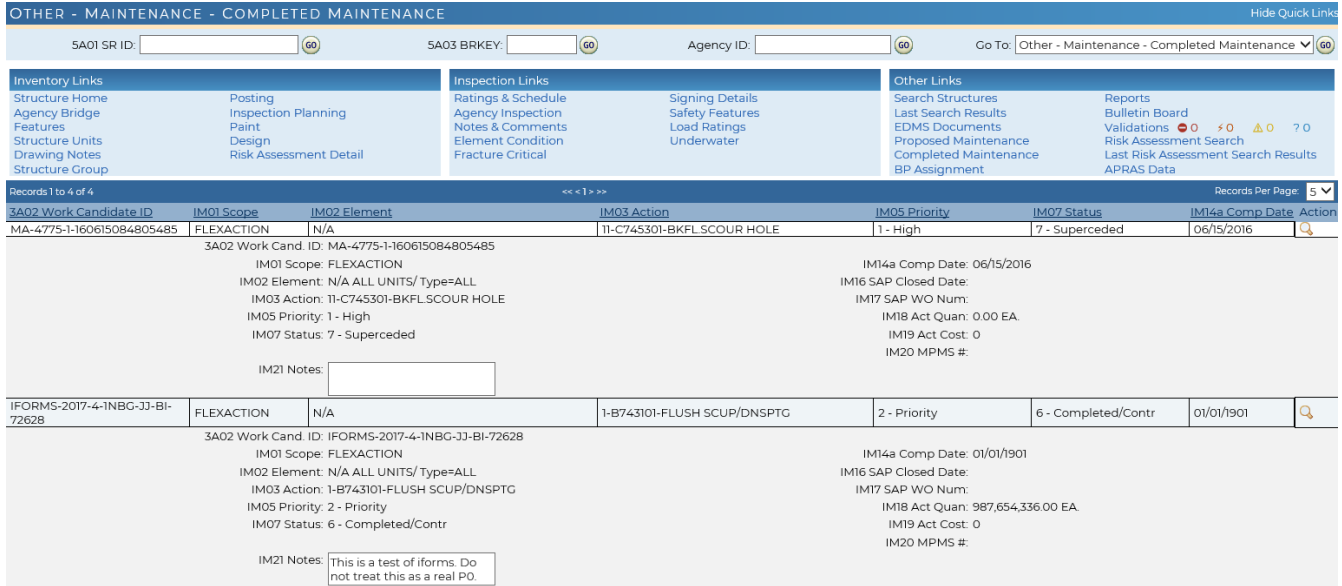


Figure 2.7.5-1 Completed Maintenance Detail Screen

2.7.6 Coding Completed Maintenance Items in BMS2

This section discusses how to code completed maintenance items that were performed by Department Forces and by Contract.

When maintenance is completed and a work order is closed in SAP, BMS2 will receive notification. Depending on the type of maintenance performed, item IM07, status of the work item, will change to either a "4 - Review Required" or "5 - Completed/Dept". For those items whose status is "4 - Review Required", a follow-up review from the District Bridge Unit or consultant is required to ensure that the repair work was completed satisfactorily. After determining that the work has been performed properly, the reviewer may change the status to "5 - Completed/Dept" and save the change in status. No additional review is required for maintenance items whose status is "5 - Completed/Dept". The date completed, actual quantities and costs (Items IM14, IM18 and IM19) will be taken from SAP/Plant Maintenance.

When maintenance work is completed by contractor forces, item IM07, Status, must be changed to "6 - Completed/Contr". Users must also update items IM04 - Estimated Quantity and IM10 - Estimated Cost with actual values on the Proposed Maintenance screen. Once changes to these fields have been made and saved, the work item will be stored in the Completed work tab.

When maintenance work has been eliminated due to major rehabilitation or replacement work, then the status must be changed to "7 - Eliminated", and the actual date of the work should be coded in item IM14. This section discusses how to code completed maintenance items that were performed by Department Forces and by Contract.

2.8 Assigning Business Partners

By definition, PennDOT users have access to all structures in BMS2 and therefore do not have to be assigned access to specific structures. However, after registering as Business Partners non-PennDOT organizations must be assigned to a structure or group of structures before that organization’s users can access BMS2 Web information.

2.8.1 Assign Business Partners to an Individual Structure

To assign business partners as owners, owner agents, inspectors and or planning partners for a particular structure, click on the BP Assignment link in the Quick Links - Other Links section on any structure screen. This can be done either by an authorized PennDOT user or by a business partner user whose organization has been defined as an Owner or Owner agent for the current structure.

After clicking the link the Business Partner Assignment screen is displayed for the current structure.

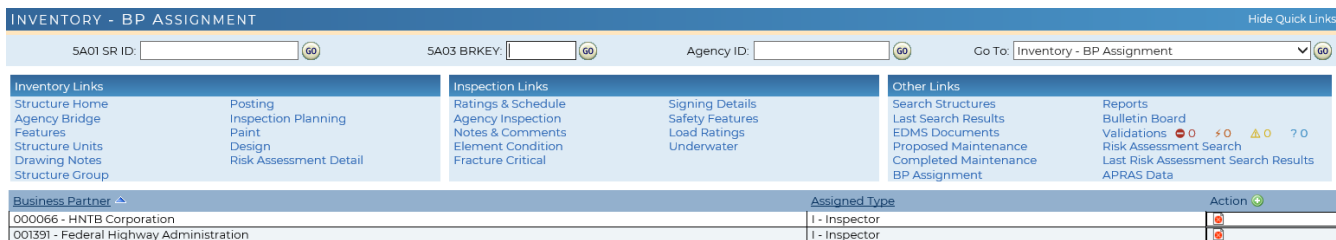


Figure 2.8.1-1 Business Partner Assignment Screen for Selected Structure

A New link is provided to create a new business partner assignment for the structure. A Remove link is provided to remove an existing business partner assignment. The screen does not restrict the number and types of assignments that can be made – a structure can be linked to multiple inspectors, owners and/or owner agents simultaneously.

2.8.2 Assign Business Partner to Multiple Structures

To assign a business partner as an owner, owner agent, inspector or planning partner to multiple structures simultaneously, a business partner assignment function is also available on the Structure List screen.

The list of structures displayed on the Structure List screen is controlled via the search criteria entered on the Structure Search screen. Before using the BP Assignment capability on the Structure List screen, ensure that the list of structures being displayed corresponds to the list of structures to which the business partner is being assigned. Every structure that is listed on the screen will be included in the set of structures used by the assignment process.

On the Structure List screen, click the BP Assignment button. This can be done either by an authorized PennDOT user or by a business partner user whose organization has been defined as an Owner or Owner agent for the current structure.



Figure 2.8.2-1 Structure List Screen - BP Assignment Button

After pressing the button additional fields and buttons appear at the top of the screen. A Business Partner dropdown is available to select the business partner to be assigned, along with an Assign Type. Grant and Revoke buttons are provided to either grant access to the structures (assign the business partner) or revoke access (unassign the business partner).



Figure 2.8.2-2 Business Partner Dropdown and Assign Type

When the user selects a business partner and assignment type in the dropdowns and clicks the Grant button, the system creates an assignment record for the business partner with the specified role for every structure included in the displayed list. If the business partner is already assigned to one or more of the structures, the assignment is not duplicated – the process simply ignores that particular structure(s).

When the user selects a business partner and assignment type in the dropdowns and clicks the Revoke button, the system deletes the assignment records for the specified business partner and role from every structure included in the displayed list. If the business partner is not assigned to one or more of the structures with the selected role, the revoke has no effect – the process simply ignores that particular structure(s).

2.9 Bulletin Board Screen

The BMS2 Web Bulletin Board allows PennDOT Central Office to post messages on its BMS2 Web site. Only authorized personnel may post messages. Users should monitor the bulletin board on a regular basis as this is the main method of communication between BMS2 and iForms users and the Bridge Inspection Section on a regular basis. Each new release of BMS2 and/or iForms is announced on the bulletin board as well as any bugs that have been identified and have not been addressed.

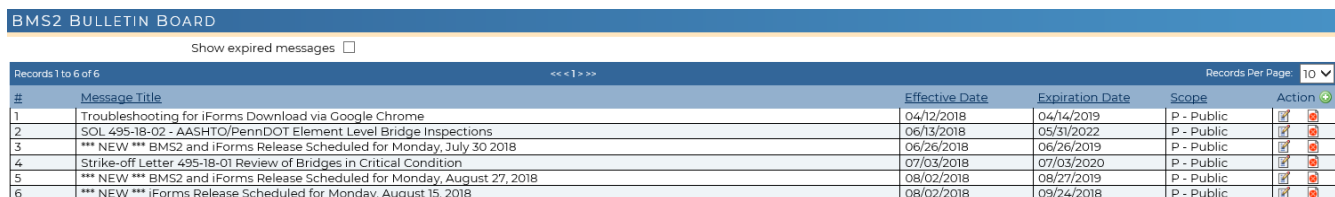


Figure 2.9-1 Bulletin Board Screen

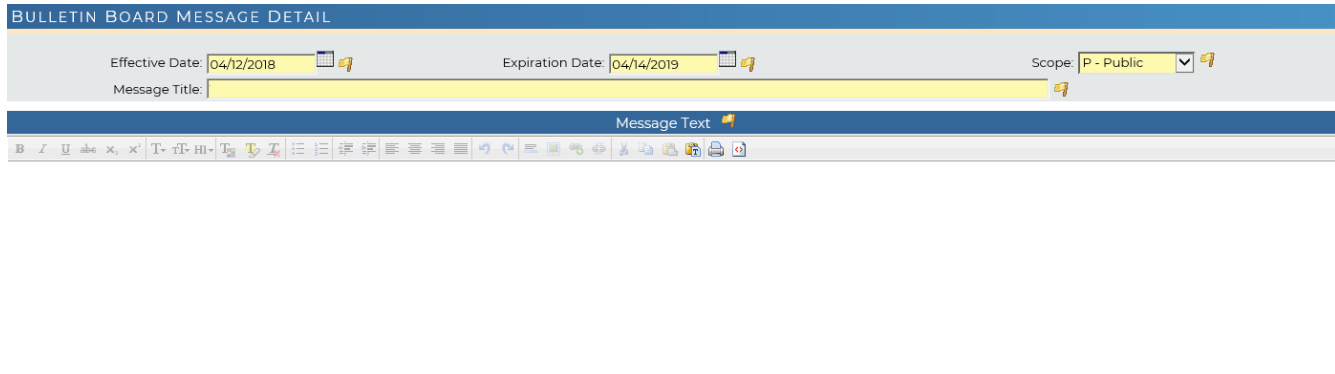


Figure 2.9-2 Bulletin Board Message Detail Screen

2.10 Validations

The validations were designed to ensure the data being submitted by inspectors is valid for the field. Users can view the number of active validations on a bridge next to the screen link for Validations under “Other Links”. The validations are listed from left to right, in decreasing severity from “failure” to “info”. When there are no validations of a specific type (Failure, Error, Warning, Info), the number 0 will appear to the right of the designated symbol. The number of active validations will appear next to the corresponding symbol for each severity level. The number and symbol will have an inverted color scheme compared to when there are zero validations. The count per validation type will update each time the validation page is visited for a particular bridge as well as every Monday morning when the batch process is run.

When a user clicks on the validation screen, any validations that apply to the bridge currently being viewed in BMS2 will be displayed. In addition to listing the BMS2 field(s) triggering the validations, a message is displayed to explain why the validation has appeared. Once the field is updated and saved, the validation message will automatically be deleted upon clicking the validations button, if the information meets the criteria of the field. Additional validations will continue to be added to ensure the accuracy of the data stored within BMS2.

Validations can be programmed for BMS2, iForms or both. These settings are controlled by the Bridge Inspection Section. The determination of the applicability of the validations is based on who is responsible for updating the field. For example, the validations in iForms are generally restricted to inspection items while BMS2 validations include both inventory and inspection items. Furthermore, the validations vary based on structure type. For example, validations about bridge deck width and roadway width only apply to bridges and are not applicable to signs and walls.

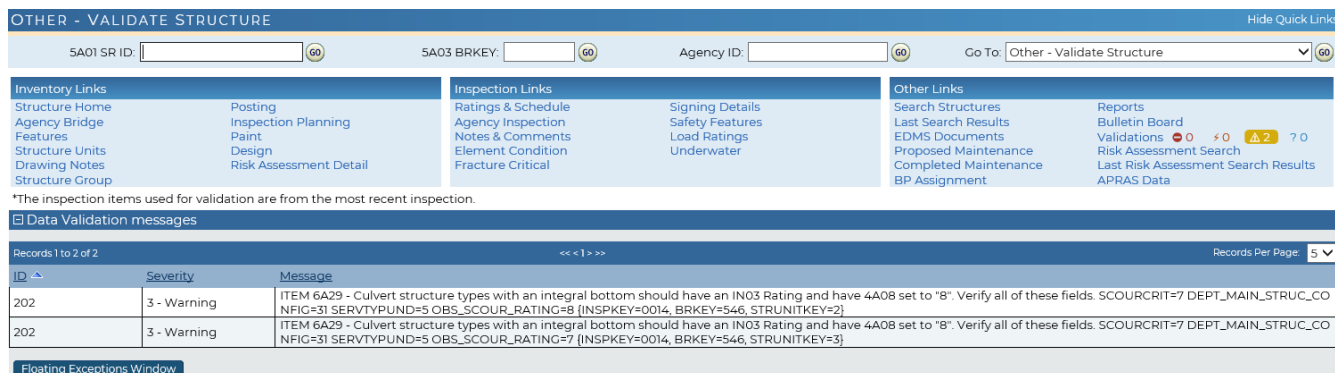


Figure 2.10.1 Validation messages screen

2.10.1 Inspection Acceptance


The main goal of the validations is to correct data within BMS2, most importantly for the NBI submission as well as for inspection planning (i.e. bridges requiring underwater inspections, inspection frequencies, etc.). To ensure validation failures and errors are addressed, a pop-up box will appear when the users attempt to submit an inspection from *iForms* to BMS2 or when the user attempts to move the inspection status (Item 1A09) from any status to “9 – Accepted”. The pop-up box will display notes from the previous inspection related to the validation failures and errors (if applicable).


These notes are stored in two different fields. The first comment type, 478, displays the comments from the user submitting an inspection to BMS2 from *iForms*. The second comment type, 479, displays the comments from the user accepting the inspection. For the current inspection, the user must enter a minimum of 50 characters that explains why the validation errors are not being addressed. These notes will be helpful to users at the District and Central Office in understanding why the errors still remain.


2.10.2 Validation Levels




There are four different levels of validations:

Failure (First icon/number; 

Error (Second icon/number; 

Warning (Third icon/number; 

Info (Fourth icon/number; 

2.11 Reports Screen

Reporting is a useful way of retrieving data stored in BMS2. There are two ways to view and generate reports - (1) Internal BMS2 reports, and (2) Crystal Reports software.

2.11.1 BMS2 Reports Screen

At the Department’s discretion, reports may be posted on BMS2 Web and used by Business Partners. To access and run reports from BMS2 Web, click on the Reports link in the Other Links section on any structure screen. A list of available reports will be displayed for the user.

To run a report, click the Run Report icon under “Action”. Refer to Figure 2.11.1-1. Depending on the report, a list of input parameters may appear for the user to enter. The user can use the parameters to filter out structures that

are not required. Depending on the complexity of the report, it may take seconds or minutes until the report has finished running. Users may then export the report into an Excel or PDF format for their use.

Not all reports are available to all users. For example, Inspector Supervisor roles will have access to more reports than the browser roles.

Report Name	Action
BMS2001 - BMS2Web_Background	🔍
BMS2002 - BMS2Web_Bridge Inspection met	🔍
BMS2003 - BMS2Web_Bridge Inspection eng	🔍
BMS2004 - BMS2Web_D491	🔍
BMS2005 - BMS2Web_Insp Schedule Info	🔍
BMS2006 - BMS2Web_Inspection Appraisal History	🔍
BMS2007 - BMS2Web_Inventory SIA met	🔍
BMS2008 - BMS2Web_Inventory SIA eng	🔍
BMS2009 - BMS2Web_ScourCritical_BRG_Map	🔍
BMS2010 - BMS2Web_M1 - NBIS Monthly Compliance Report	🔍
BMS2011 - BMS2Web_WCP001 Closed or Post Hwy Brdg	🔍
BMS2012 - BMS2Web_D491_Tunnel	🔍
BMS2013 - BMS2Web_M1_Rpt_Tunnel	🔍
BMS2014 - BMS2Web_M1_Underwater	🔍
BMS2015 - BMS2Web_Scour_Plan_Action	🔍
BMS2016 - BMS2Web_Bridge Validation Report	🔍

Figure 2.11.1-1 Reports Screen

2.11.2 Crystal Reports

BMS2 inspection data is confidential under State and Federal laws and its dissemination must be carefully controlled. The District Bridge Engineers are responsible to see that this sensitive information is not inadvertently released through this reporting tool. Access to BMS2 data using Crystal Reports and the PENNDOT ePortfolio web server is only available to PENNDOT users and not outside agencies.

Frequently used or otherwise important reports can be "published" to the PennDOT Business Objects web server to enable others to view them without re-creating the report definition and without installing Crystal Reports on their local workstation.

The Asset Management Division is responsible for authorizing user access to BMS2 and BMS2 data through the PennDOT Business Objects web server. Users requesting access to BMS2 and BMS2 data through the PennDOT Business Objects web server must complete a "Request for BMS2/ APRAS Access" and submit to the BMS2 manager in Central Office. A user may have READER or PUBLISHER access.

A READER is a user who can access published reports on the PennDOT Business Objects web server through their Internet Explorer browser and can adjust parameters to customize the report and specify output format (e.g. hardcopy print, Excel Worksheet, etc.) and must have access to PennDOT network.

A PUBLISHER is a user who has the same capabilities as a READER, can add reports to the PennDOT Business Objects web server for other users to run and have a copy of the Crystal Reports Developer software on desktop.

The folder structure on the PennDOT Business Objects web server provides a repository for statewide reports and locations for district-specific reports. An individual user can run queries using the report definitions in the statewide or District folders but cannot modify them without first copying to his folder.

2.12 iForms and BMS2 Web

In order to perform bridge inspections, inspectors are required to use PennDOT’s data collection software – iForms. This section provides guidance on how iForms interacts with BMS2 web.

Due to the availability of the iForms web services across the Internet, all users – PennDOT and non-PennDOT - will be required to enter their BMS2 Web userid and password when submitting inspections from iForms or requesting the download of inspection data to iForms from BMS2. iForms also provides the ability to download inventory and inspection documents from EDMS that are linked to the structure so that they can be viewed during an inspection.

2.12.1 iForms BMS2 Web UserID and Password

Within iForms, a screen is provided to facilitate the entry and validation of the user’s BMS2 Web credentials (userid and password).

iForms can continue to operate while disconnected from a network. If this is the case, the iForms application is not communicating with BMS2 Web. If the workstation is connected to the internet, then the user may upload and/or download inspection-related data via BMS2 Web through their internet connection. In this latter case, the iForms user will be asked to provide their BMS2 Web credentials for security validation.

The first time an iForms user utilizes BMS2 Web for a particular session, a dialog entry form is displayed for the sole purpose of collecting the user’s BMS2 Web credentials (userid and password). Once the credentials are entered, the user clicks the OK button and a web service is invoked to validate the userid and password. Passwords are limited to 12 characters.

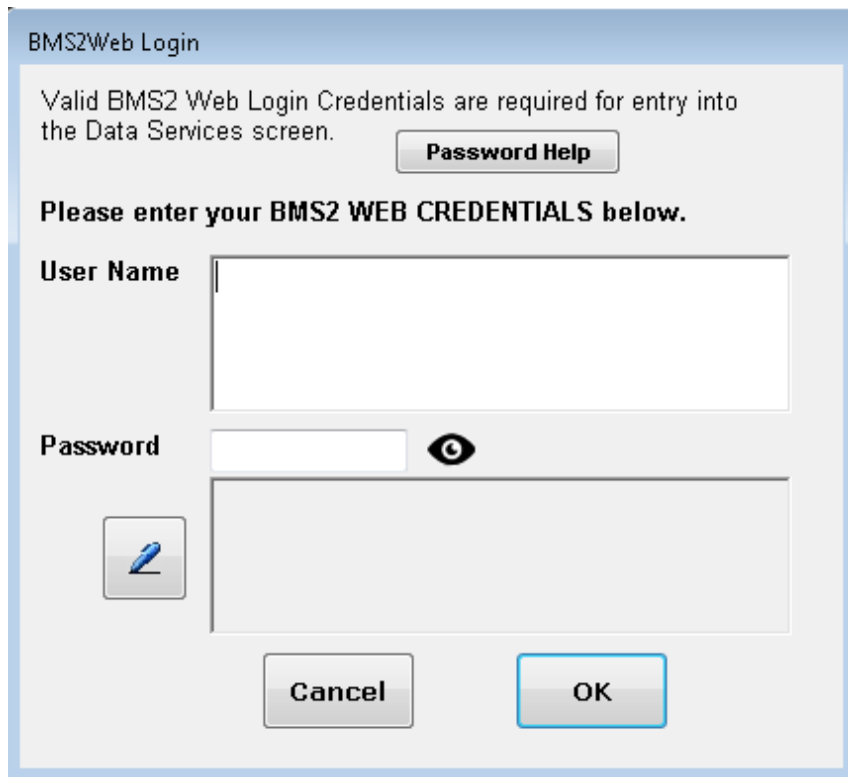


Figure 2.12.1-1 BMS2Web Login Credentials Entry Screen

If the credentials are valid, the original function selected by the user will be carried out (for instance, the submission of an inspection). Additionally, the BMS2 Web credentials will be cached in internal memory for the duration of

the user's *iForms* session (i.e., until *iForms* is closed). The user will not be prompted to enter their BMS2 Web credentials again during their *iForms* session.

The user's BMS2 Web credentials are not saved locally and exist in memory only for the duration of the user's session. Any subsequent web service call from *iForms* will pass the cached credentials so that the user will continue to be authenticated each time a BMS2 Web service is invoked.

Note: To submit *iForms* inspections into BMS2 via BMS2 Web, users must have a user ID and password that is valid for BMS2 Web, but they don't have to be logged in because they will be prompted for login automatically.

2.12.2 *iForms* EDMS Document Download

The purpose of the *iForms* EDMS functionality is to facilitate the download and viewing of EDMS documents associated with a specific structure/inspection. Within *iForms* this is implemented through two different screens:

- *iForms* Data Services
- Electronic Documents

2.12.3 *iForms* Data Services Screen

The user may elect to download EDMS documents in conjunction with downloading inspection data via the Data Services screen or may choose to download the electronic documents at the individual inspection level from the new Electronic Documents screen.

From the Data Services screen, electronic documents associated with multiple structures can be downloaded in conjunction with the inspection data for selected structures. Two levels of download customization exist on the Data Services screen – at the overall “grid” level and at the specific structure level.

Two additional checkboxes are provided at the overall grid level to permit the user to specify that only the inventory or inspection related electronic documents are to be downloaded for the structures selected in the grid. Both the download inventory and inspection electronic document checkboxes are selected by default. If the user does NOT wish to download any electronic documents the checkboxes must be deselected.

Additionally, at the structure (row) level, the user can exclude all electronic documents for an individual structure from being downloaded by deselecting the eDocs checkbox that is presented in the grid beside the structure selection checkbox. By default, the eDocs checkbox is selected, indicating EDMS documents are to be downloaded, when the corresponding Download checkbox is selected.

When the user then clicks on the “Retrieve Inspections for Selected Structures” button, a confirmation dialog box is presented indicating Electronic Document download requires additional network connection time to complete. Assuming the user elects to continue, the inspection data is downloaded as the first unit of work. Subsequently, the electronic documents for each of the structures selected are downloaded one at a time via http file transfer.

Viewing and uploading of electronic documents is provided by the Electronic Documents Screen.

BMS2 - iForms Main Container - [BMS2 Data Services]

File DataServices Window Help

Use iForms to perform QA inspections **Retrieve Code and Reference**

Service Enable

Choose the initial filter for the structures to be considered:

Select County District:

Select District

 Enter BRKEY List

 Import BRKEY List

Structures Available for Inspection:

Select Electronic Documents to Download:
 Inventory
 Inspection
 Structures in this Listing: 3426

	Dwnload?	EDocs?	SR ID	Ref ID	Structure Name	Feature Intersected
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	20730288024007	13540	CITY OF TITUSVILLE	OVER TROUT RUN
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	20722703014000	13490	TROY TOWNSHIP	OVER RED RUN
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	20720903004005	13427	EAST MEAD TOWNS	OVER MORREL RUN
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	25001902701354	15889	SUMMIT TOWNSHIP	OVER LEBOEUF CREE
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	25721403014006	16465	NORTH EAST TOWNS	OVER TWELVE MILE
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	27720603274002	17268	JENKS TOWNSHIP	OVER WOLF RUN
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	43721408003250	26188	LIBERTY TOWNSHIP	OVER SLIPPERY ROC
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	43722809470750	26294	COLTER RD. BRIDGE	OVER BIG RUN
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	60032200202224	33742	CANAL TOWNSHIP	OVER MC CUNE CRE
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	60721306280000	33909	PINE GROVE TWP	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	60721306890000	33911	PINE GROVE TWP	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	25009002350442	46450	VMS DYNAMIC SIGN	I-90 W.B.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	25009003351076	46449	VMS DYNAMIC SIGN	I-90 W.B.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	43008000551344	47245	VMS DYNAMIC SIGN	SR 80 WB
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	60008003802335	44305	VMS I-80 EXIT 42 EB	SR0080 EB
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	25000504800629	48599	NOISE WALL,SR 5	SR 0005
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	20000609200819	12906	CAMBRIDGE TOWNS	OVER FRENCH CREE
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	43202101301715	25970	SANDY LAKE TOWNS	OVER BUTCHERY CR
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	60002702901082	42737	OIL CREEK TOWNSH	OVER PINE CREEK B
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	25009000100905	16016	SPRINGFIELD TOWN	OVER TURKEY CREE
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	20032205300826	13111	EAST FAIRFIELD TO	OVER FRENCH CREE
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	25000804302576	15854	VENANGO TOWNSHI	OVER ALDER BROOK
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	25009000140559	16017	SPRINGFIELD TOWN	OVER TURKEY CREE

List Retrieved 6/19/2019 7:02:19 AM

Figure 2.12.3-1 Data Services Screen

2.12.4 Electronic Documents Screen

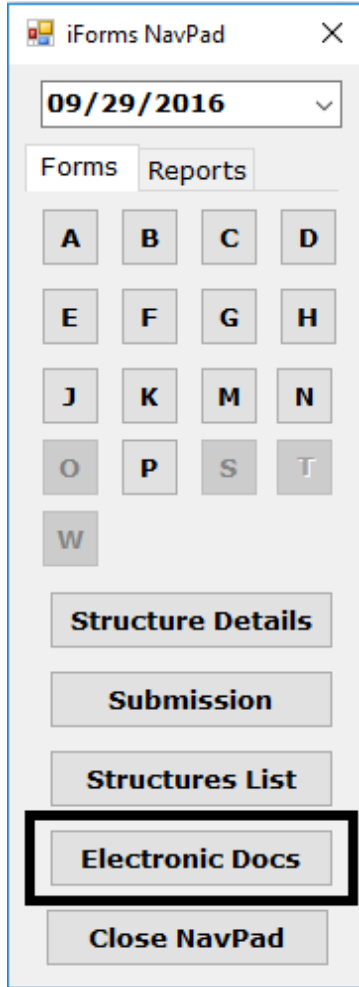


Figure 2.12.4-1 NavPad Electronic Documents Button

During an iForms session, the user typically views inspection data for a specific structure. Should the user elect to also download associated EDMS documents, then the NAVPAD can be used to open the Electronic Document screen for the structure.

From the Electronic Documents screen, electronic documents can be downloaded and viewed based on the user initiating the download. Using the Electronic Documents screen, download is limited to a single structure at a time.

When the inspection data is downloaded to the EDC, it includes a listing of the existing EDMS documents already linked to the structure/inspection. When the Electronic Document screen is opened, that listing is presented to the user in 2 groupings: inventory related and inspection related. It is assumed that the inspection related documents are only those associated with the most recent, accepted inspection. When a new inspection is created from the prior inspection, the inventory links are brought forward but not the inspection related electronic document links. They will, however, be available if the user views the previous inspection.

The user can utilize the DWN (download) checkbox to download individual documents. This ability to select individual documents for download provides the user with a granular way to limit the amount of information downloaded and subsequently, the amount of network connectivity required.

The user can select one or more documents to download. The download is initiated by clicking on the "Download Selected eDocs" button. The user can elect to download all inspection document and/or all inventory documents by clicking on the Select All button for the specific group to be downloaded.

To view the documents, the user simply clicks on the VIEW button in the row corresponding to the selected document. It is assumed that the document is presented using an application already installed on the client machine, invoked based on the file associations (e.g. a PDF file may open in Adobe Acrobat Reader). The display of the documents is completely dependent upon the file associations. No specific viewer functionality is provided within BMS2.

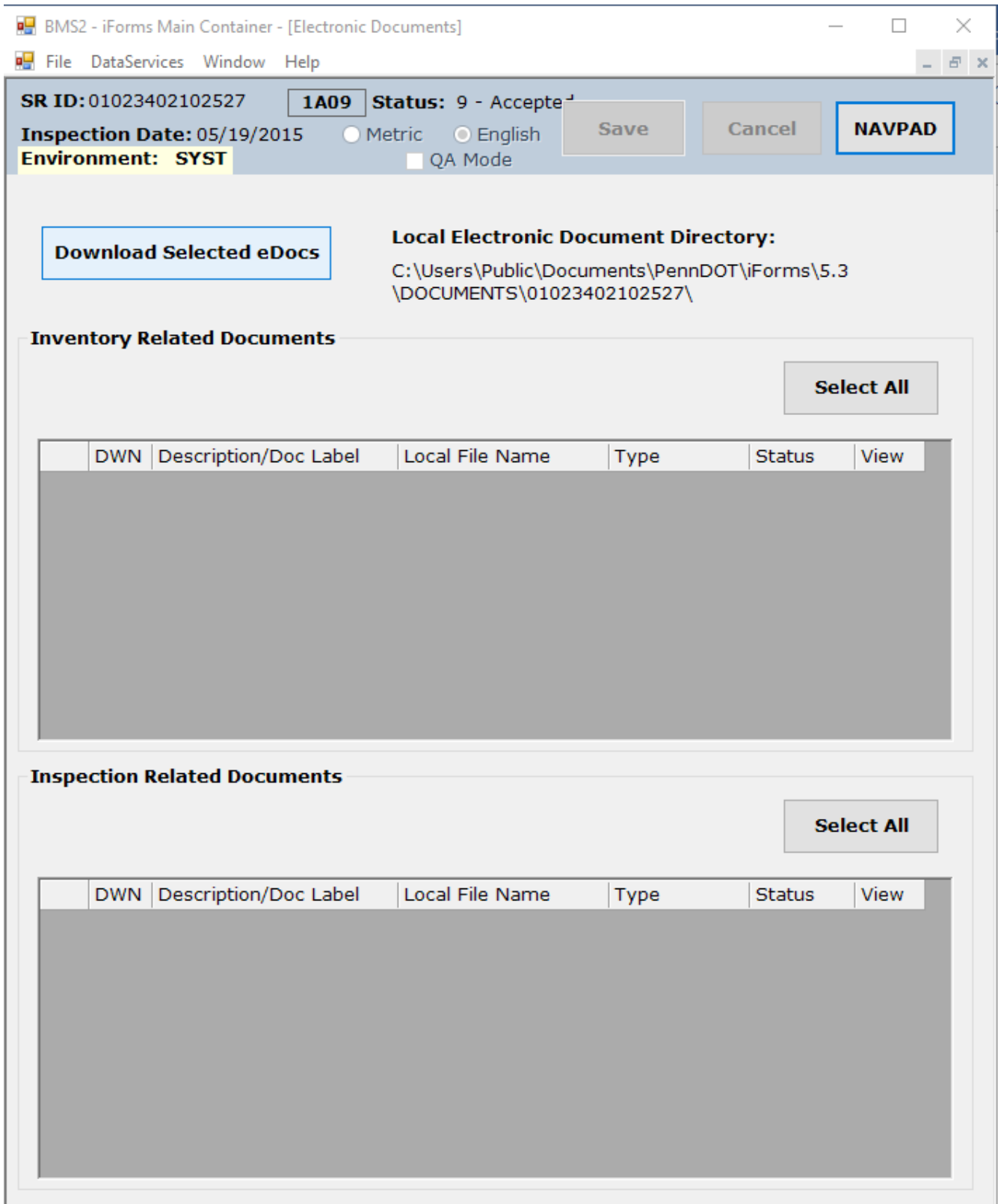


Figure 2.12.4-2 eDocuments Screen

2.13 Risk Score

The Risk Score is a tool that utilizes bridge inventory data from BMS2 to define the enterprise level risk to be used as a key component in the prioritization of bridge work. The methodology is such that the overall risk of a structure to the overall transportation network is calculated, independent of condition. Enterprise level risk is a relatively static number and, when used in conjunction with more variable attributes like condition, produces information that can be used to prioritize work on structures.

The fundamental difference between the current risk score and previous risk assessment is that the current risk score maintains its independence of condition. While both risk and condition are required to generate prioritization, by keeping risk as a standalone attribute, it becomes a key component in the prioritization process that can be iteratively improved over time. This allows the Department to not prioritize based on a “worst first” approach and allows for the transition to an asset management based prioritization, which will achieve lowest life cycle cost.

Prioritization based on BMS2 risk and condition values can be accomplished in a variety of manners, from simple Excel sheets to complex multi-objective decision analysis (MODA) software tools. In the most simple sense, BMS2 can be queried for a District or Planning Partner’s bridges to pull their current deck, super, sub or culvert condition and risk scores. The list can be manually split between identified potential preservation, rehabilitation and replacement scopes of work, then sorted by risk, and finally programmed based on available funding.

This process can be modified to a more advanced level to include additional fields to make the selection process more in-depth, such as including duration in current or previous condition states, and information outside BMS2 such as maintenance activities, over-height vehicle impacts or weather related items. The District’s more detailed knowledge of the bridges, state and local network needs, corridor improvements, and other programming considerations must be evaluated in conjunction with the scores and rankings to establish a final priority for programming.

PennDOT Searches for risk score data can be initiated via several locations within the BMS2 web screens.

Access to the Crystal Report for Risk Score is structured to enable the District or Central Office users to easily and quickly obtain and filter scoring information.

- The report is available to be run on demand.
- The report can be scheduled to run through the Business Object Server.
- The report can be exported in an Excel spreadsheet through the crystal export function.
- Automatic exporting to Excel can also be defined using the Export option. This would allow the users to export to Excel without having to view the report.
- After export, the user can save the result to the local drive or Network.
- Filters can include but are not limited to District, County, SR and other standard inspection and inventory data, Risk Score Date, Agency Admin Area, Owner, Business Plan Network, MPMS number, under construction, Legislative information, reconstruction history for deck/superstructure/substructure, or permanently closed status.

2.13.1 Accessing Risk Score

2.13.1.1 From the Structure Search Menu

After logging into BMS2 web, the tool bar in the Structure Search screen (see Figure 2.13.1.1-1) provides direct access to the Risk Score Search screen after clicking on “Risk Score”.

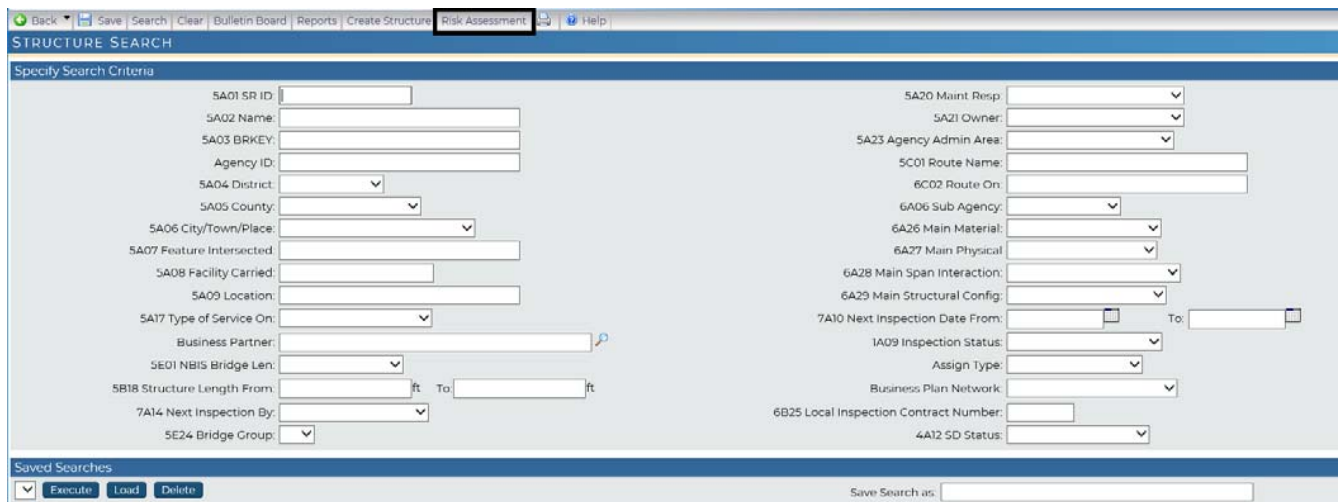


Figure 2.13.1.1-1 Risk Score Screen Links

2.13.1.2 From a Bridge File

While in a bridge file, users can select the Risk Score Detail item in the Inventory window to display the current Risk Score data for the structure.

Selecting “Risk Score Detail” provides the risk scores and ranks for the current bridge selected (see Figure 2.13.1.2-1). All scores and ranking fields are internally calculated within BMS2 and cannot be changed by the user. A comments field enables the Engineering Districts to provide any information that may or may not support the bridge ranking and assist in determining the best means of planning to improve the bridge condition.

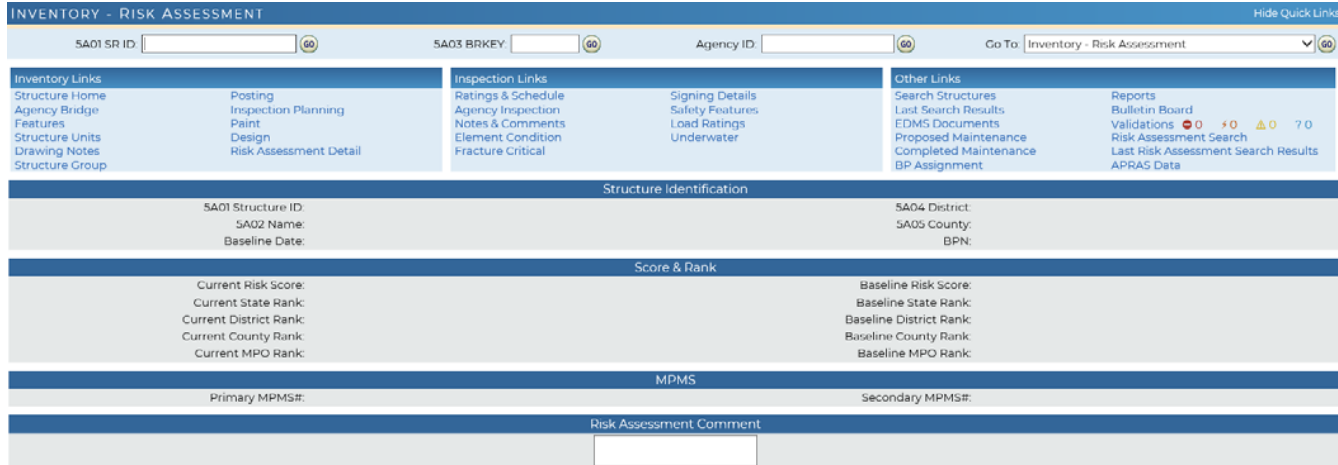


Figure 2.13.1.2-1 Inventory Links

2.13.1.3 From a Structure File

While in a structure file, links for searching risk score data for other structures are available in the Other Links window (see Figure 2.13.1.3-1). The user can also obtain information for the last risk score for the structure.



Figure 2.13.1.3-1 Other Links

2.13.2 Running a Risk Score Search

Selecting “Risk Score Search” enables the user to specify a different bridge or list of bridges than are currently open to obtain data based on the search criteria. The drop-down menu for “Baseline Date” is a required field (see Figure 2.13.2-1). The “Baseline Date” field is the date determined by the Bridge Inspection Section when the risk assessment module is run so that the data captured can be queried and compared with previous results to monitor improvement or decline in overall or specific bridge conditions. Data capture occurs on the first business day of each quarter. Permanently closed structures identified as such in the Inventory Posting Screen (VP) VP10 block can be excluded from the search by checking the appropriate filter box shown below.



Figure 2.13.2-1 Risk Score Search Screen

The results of the search is a list of structures based on chosen criteria that presents a tabulation of the risk assessment scoring and ranking data that has been stored in BMS2 (see Figure 2.13.2-2). The data shown in the search results structure list screen cannot be modified by the user.

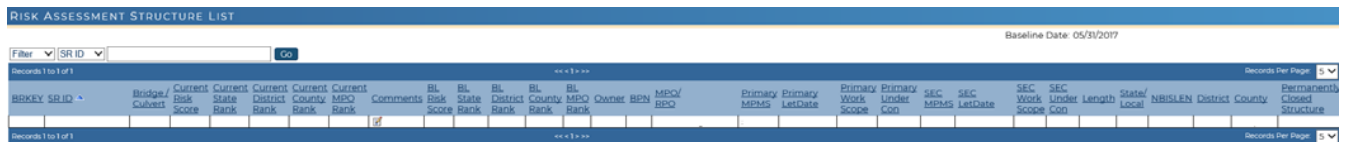


Figure 2.13.2-2 Risk Score Structure List Screen

Each structure in the list will have its own row of data under the data fields listed above. MPMS data for each structure is also presented with the scoring and ranking information.

A maximum of two MPMS numbers (primary and secondary) will be associated with each BMS2 structure. If there are more than two MPMS numbers associated with a structure, the two MPMS numbers shown will be selected based upon let dates and current date.

MPMS extract and BMS2 updates will be run daily as part of the automatic BMS2 batch cycle to accumulate additional information associated with the risk score and populate the risk score tables in BMS2.

As part of the data review, a Crystal Report can be run that can cover features such as District, County, SR and other standard inspection and inventory data, Baseline Date, Agency Admin Area, Owner, Business Plan Network, MPMS number, under construction, Legislative information, reconstruction history for deck/superstructure/substructure, permanently closed status, year built, year reconstructed, various rankings including by MPO, MPMS data for PE, FD, and scope. See Section 2.11.2 for additional discussion of Risk Score Crystal Report features.

2.14 Structure Management

2.14.1 Creating a New Structure

When a new structure (e.g. bridge, sign structure, retaining wall, noise wall, tunnel, other) needs to be entered into BMS2, users (at a minimum, inspection supervisors) must select the Create Structure Assistant which allows users to create a new structure in BMS2. This screen is accessed by selecting the **Create Structure** button at the top of the structure search page in BMS2. Appendix A provides a list of required fields for be entered for creating a new structure. New BRKEYs should not be created for superstructure replacements.

To create a new structure, follow the procedure as described.

1. Select the **Create Structure** at the top of the structure search screen.
2. Users will be asked to enter a predecessor BRKEY if the new bridge replaced a previous bridge. By entering a predecessor BRKEY, a link between the structures will be created on the Structure Group page and certain fields will be prepopulated on the prompts discussed below.
3. Follow the step-by-step prompts from one screen to the next. The user will not be able to progress to the next screen unless all of the necessary fields (yellow background) are filled out. The system will ensure the data inputted from the user meets certain validation criteria. Fields with incorrect data will be filled with a red background after the user acknowledges a list of the validation errors. Complete all fields on each of the "Required Data" screens.

Note: The NBI Structure number (5A03) and the Bridge Key (BRKEY) will be automatically generated by BMS2 at the completion of the create structure process. The Structure ID (Item 5A01) must be entered by the user in the 14-character SR ID (County/SR/Segment/Offset) format.

4. After entering the required fields, review the summary sheet of information. Upon review, click the submit button. A pop-up will be displayed to confirm the user is ready to create a new structure. If the creation was successful, a pop-up will display the new BRKEY for the created structure.
5. After acknowledging the new BRKEY, the user will be directed to the Structure Home page for the newly created structure. The remaining inventory data must be immediately entered via the remaining BMS2 screens with the exception of State Roadway data (see step 7). The structure inventory data must be entered into BMS2 prior to bridge being opened to traffic. No inspection data shall be entered at this time. Inspection data shall be entered through iForms at the time of the initial inspection.

The BMS2 fields in table 2.14-1 shall NOT be entered by the user. These fields are automatically entered based on the information that has been entered and saved in the corresponding Agency screen or Create Structure Wizard.

[the remainder of this page is intentionally left blank]

BMS2 Fields NOT to be entered by the user	Corresponding Agency/Wizard field to be entered by the user
4A01 - Is the Bridge Open, Posted or Closed?	VP02 - Posting Status (This item should be coded "G - New Structure, not yet opened to traffic" until the initial inspection has been completed and bridge is open).
4A15 - Minimum Vertical Clearance over Bridge Roadway	6C20 - Min. Vertical Clearance for Left Roadway 6C21 - Min. Vertical Clearance for Right Roadway
4A17 - Minimum Vertical Underclearance	6C20 - Min. Vertical Clearance for Left Roadway 6C21 - Min. Vertical Clearance for Right Roadway
4B04 - Operating Rating Type	IR06 - Rating Method
4B05 - Operating Rating	IR11 - Operating Rating
4B06 - Inventory Rating Type	IR06 - Rating Method
4B07 - Inventory Rating	IR10 - Inventory Rating
4B08 - H20 Operating Rating Type	IR06 - Rating Method
4B09 - H20 Operating Rating	IR11 - Operating Rating
4B10 - H20 Inventory Rating Type	IR06 - Rating Method
4B11 - H20 Inventory Rating	IR10 - Inventory Rating
4B12 - ML80 Operating and Inventory Ratings	IR10 - Inventory Rating IR11 - Operating Rating
4B13 - TK527 Operating and Inventory Ratings	IR10 - Inventory Rating IR11 - Operating Rating
5B01 - Bridge Deck Structure Type	6A38 - Bridge Deck Type
5B08 - Median Type	6C25 - Median Type
5B12 - Main Span Material (FHWA)	6A26 - Material Used for Main Unit, Approach Unit, Sign Structure and Walls
5B13 - Structural Configuration of Main Spans (FHWA)	6A29 - Structural Configuration for Main Unit, Approach Unit, Sign Structure and Walls
5B15 - Approach Span Material (FHWA)	6A26 - Material Used for Main Unit, Approach Unit, Sign Structure and Walls
5B16 - Structural Configuration of Approach Spans (FHWA)	6A29 - Structural Configuration for Main Unit, Approach Unit, Sign Structure and Walls
5B19 - Deck Area	5B07 - Out-to-Out Width of Bridge Deck 5B18 - Structure Length
5C24 - Vertical Clearance over 10 ft Width (Defense Highways)	6C22 - Vert. Clear. Over 10 ft Width for Left Rdwy 6C23 - Vert. Clear. Over 10 ft Width for Right Rdwy
5C25 - Total Horizontal Clearance	6C18 - Total Horiz. Clearance for Left Roadway 6C19 - Total Horiz. Clearance for Right Roadway

Table 2.14-1 Data fields automatically filled in by BMS2

6. In order to view and enter information into the PennDOT specific BMS2 screens (Inventory, Inspection, Features Intersected and APRAS Span), the user must log into BMS2 and search for the appropriate structure. After selecting the structure from the search results, the user may select the desired screen.
7. Local roadway and other intersecting features data can also be entered for a new structure at any time, using the Inventory - Roads (Screen 5C) and Agency - Roadways (Screen 6C) screens and the Inventory - Features Intersected screen.
8. If the new structure is located on and/or over a state route, the RMS location information must be created before any Roadway inventory information is entered in BMS2. However, enter the value for 5C06 prior to RMS interface. RMS will then enter data for the corresponding features for the entered route numbers. In order to properly create the RMS location information and allow RMS roadway information (See the Inventory - Roads and the Agency - Roadways screens) to be automatically updated for a structure in BMS2, **the District BMS coordinator shall provide the District RMS coordinator the newly created BRKEY number (Item 5A03).** The RMS coordinator requires the new BRKEY to create the structure in RMS. After the roadway information has been entered and saved into RMS, the data will be sent to BMS2 in an overnight batch cycle.

For new structures, it is imperative that the BMS coordinator provides the BRKEY to the RMS coordinator the day the structure was created because APRAS utilizes RMS to locate bridges and BMS2 data to analyze permits. If the new structure is replacing an existing structure, the RMS location information for the existing structure must be changed to point to the new structure BRKEY (if the new structure is in roughly the same location) or the existing RMS locations for the old structure must be deleted and new ones created for the new structure. RMS ties a structure location to BRKEY, and therefore the state roadway locations for an existing (demolished) structure cannot automatically be linked to a new (replacement) structure.

9. Once the overnight batch cycle has run and the State Roadway information has been updated for the structure in BMS2, review the new roadway data (See the Inventory - Roads and Agency - Roadways screens) to confirm that it is correct and enter any additional roadway-related inventory data as necessary.
10. The BMS Coordinator shall verify the SR ID (Item 5A01) with the RMS Coordinator.
11. After all inventory information has been entered, set the status of the inspection to "9 - Accepted" for item 1A09 on the Ratings and Schedule screen.

All inventory items pertinent to the structure should be filled in. Particular attention must be given to the asterisk items to ensure all FHWA-required fields are accurately completed for the structure.

Figure 2.14.1-1 Create Structure Screen

2.14.2 BMS2 Structures Removed from Service

The process of removing a structure from BMS2 is considerably different than deleting a structure from the old BMS. The previous procedure in BMS was to submit a bridge deletion form to the former Bridge Quality Assurance Division (BQAD) to have a structure deleted from the system. In BMS2, however, authorized users at the Districts will be able to change specific fields to indicate that the structure has been removed from service. If the old structure is being replaced, the user must ensure that a new structure has been entered into BMS2 prior to marking demolished. The following sequence of steps should be followed when a new structure replaces an old structure. This process is applicable for all structures.

1. Create a new structure as described in Section 2.14.1. This includes notifying the RMS coordinator of the new BRKEY and being entered into RMS. Item VP02 (Posting Status) should be coded "G - New structure not yet opened to traffic" until it does open to traffic.
2. Verify that the RMS data has been updated/deleted for the old structure and that the new structure is properly located in RMS. New structures can be located in RMS by updating the existing RMS locations (for the structure being removed) with the BRKEY for the new structure, or by deleting the RMS locations for the structure being removed and adding new RMS locations for the new structure. Note that the data transfer will occur overnight after being entered into RMS.
3. On the Inventory - Posting screen, create a new posting status for the existing structure. Enter the posting status date and select "X - Demol/Replaced" for field VP02. A pop-up will appear informing the user that by changing posting status to "X - Demol/Replaced", the following changes will be automatically made:
 - a. Field 5A17 (Type Service On) value changed to "X" (Demolished/Replaced)
 - b. Field 5A21 (Owner) value changed to "XX" (PennDOT Owned, Demolished/Replaced)

- c. Field 6A12 (Demolished/Replaced Indicator) set to “checked”
 - d. Field 6A13 (Demolished/Replaced Date) is changed to match the date in VP01 for the posting status
4. When the new structure is opened to traffic, create a new Posting entry on the Inventory- Posting screen and set the VP02 (Posting Status) to "A - Open, no Restriction".

If the existing structure is being removed but not replaced, only steps 3 and 4 must be followed.

Note: When developing Crystal Reports, ensure that the reports filter out the "X" values for VP02, 5A17 and/or 5A21. Otherwise, the data in the Crystal Reports will include data from old bridges that are no longer in existence.

2.15 Email Notifications

Email notifications are used to notify Department personnel when specific bridges meet certain criteria. For example, when a bridge changes scour critical category upon acceptance or if a new structural priority 0 or 1 maintenance item is entered into BMS2. These notifications are only available for Department staff and each District will only receive notifications for bridges within their jurisdiction. Each individual BMS2 user can control the notifications they receive.

2.15.1 Accessing Email Notifications in BMS2

To access Email Notifications within BMS2, the user must hover over their name in the upper right corner of any BMS2 screen. After hovering, a box will appear with available options depending on the user’s security level. Click on the email notification link to be taken to the email notifications screen.

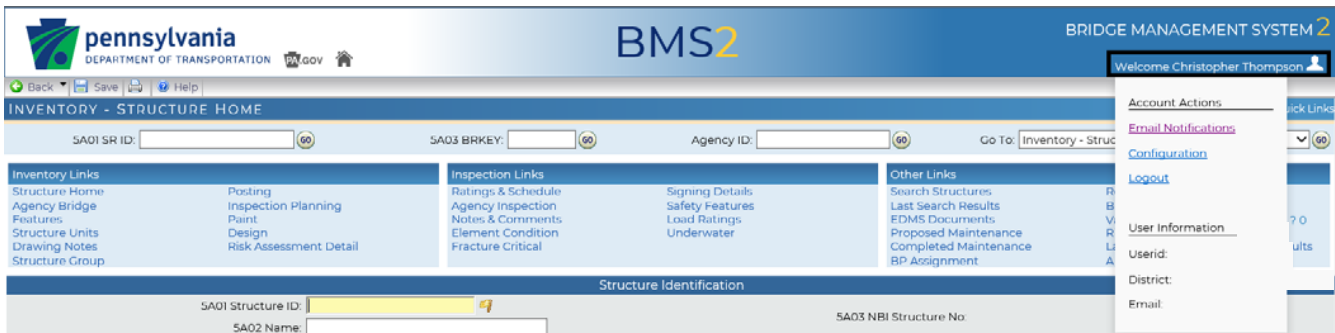


Figure 2.15.1-1 Email Notification Access

After clicking the link to email notifications, users will arrive at the Email Notification screen. By default, the list for “Subscribe to Notifications” will be minimized as shown below. To access the full list, click on the plus symbol to the left of the list.



Figure 2.15.1-2 Email Notification Screen

2.15.2 Subscribing to Email Notifications

To subscribe to email notifications, the user must expand the subscription list. Once expanded, notifications will be sorted by their ID number. Users will also see a name for the notification, a description of what the notification is used for, the frequency of the email notification and a check box that the user can check if they wish to receive the specific notification. New email notifications are added periodically.

EMAIL NOTIFICATIONS				
<input type="checkbox"/> Subscribe to Notifications Records 1 to 147 of 147 <<<1>>> Records Per Page: 150				
ID	Name	Description	Frequency	Subscribed
10	Inspections that are ready for acceptance - STATE	When inspections are in "5-ready for acceptance" status - STATE BRIDGES	30 - Weekly	<input type="checkbox"/>
11	Inspections that are ready for acceptance - LOCAL	When inspections are in "5-ready for acceptance" status - LOCAL BRIDGES	30 - Weekly	<input type="checkbox"/>
12	Inspections that are ready for acceptance - AMD	When inspections are in "5-ready for acceptance" status - AMD BRIDGES	30 - Weekly	<input type="checkbox"/>
13	Inspections that have been returned for correction - STATE	When inspections are in "8-returned for correction" status - STATE BRIDGES	10 - Daily	<input type="checkbox"/>
14	Inspections that have been returned for correction - LOCAL	When inspections are in "8-returned for correction" status - LOCAL BRIDGES	10 - Daily	<input type="checkbox"/>
15	Inspections that have been returned for correction - AMD	When inspections are in "8-returned for correction" status - AMD BRIDGES	10 - Daily	<input type="checkbox"/>
16	Underwater inspection could not be completed (IN16 = C or D) - STATE	Underwater inspection could not be completed. Inspection by divers or a return to the site during low water needs to be scheduled (IN16 = C or D) - STATE	50 - Monthly	<input type="checkbox"/>
17	Underwater inspection could not be completed (IN16 = C or D) - LOCAL	Underwater inspection could not be completed. Inspection by divers or a return to the site during low water needs to be scheduled (IN16 = C or D) - LOCAL	50 - Monthly	<input type="checkbox"/>
18	Underwater inspection could not be completed (IN16 = C or D) - AMD	Underwater inspection could not be completed. Inspection by divers or a return to the site during low water needs to be scheduled (IN16 = C or D) - AMD	50 - Monthly	<input type="checkbox"/>
19	Structural Priority 0 on STATE Bridge	Priority 0 Structural Maintenance Item on STATE Bridge	10 - Daily	<input type="checkbox"/>
20	Structural Priority 0 on LOCAL Bridge	Priority 0 Structural Maintenance Item on LOCAL Bridge	10 - Daily	<input type="checkbox"/>
21	Structural Priority 0 on AMD Bridge	Priority 0 Structural Maintenance Item on AMD Bridge	10 - Daily	<input type="checkbox"/>
22	Structural Priority 1 on STATE Bridge	Priority 1 Structural Maintenance Item on STATE Bridge	10 - Daily	<input type="checkbox"/>
23	Structural Priority 1 on LOCAL Bridge	Priority 1 Structural Maintenance Item on LOCAL Bridge	10 - Daily	<input type="checkbox"/>
25	Structural Priority 1 on AMD Bridge	Priority 1 Structural Maintenance Item on AMD Bridge	10 - Daily	<input type="checkbox"/>
26	Load Re-Rating is incomplete - STATE	Load Re-Rating Review is incomplete on STATE Bridge (IR01a is checked AND IR01b is in status "0-Not Reviewed"; "2-Re-rating Scheduled"; or "5-Re-rate other") OR (IR01a is unchecked and IR01b status is "0-Not Reviewed")	30 - Weekly	<input checked="" type="checkbox"/>
27	Load Re-Rating is incomplete - LOCAL	Load Re-Rating Review is incomplete on LOCAL Bridge (IR01a is checked AND IR01b is in status "0-Not Reviewed"; "2-Re-rating Scheduled"; or "5-Re-rate other")	30 - Weekly	<input checked="" type="checkbox"/>
28	Load Re-Rating is incomplete - AMD	Load Re-Rating Review is incomplete on AMD Bridge (IR01a is checked AND IR01b is in status "0-Not Reviewed"; "2-Re-rating Scheduled"; or "5-Re-rate other")	30 - Weekly	<input checked="" type="checkbox"/>
29	Load Re-Rating Acceptance - STATE	Load Re-Rating is ready for acceptance - STATE	30 - Weekly	<input checked="" type="checkbox"/>

Figure 2.15.2-1 Subscribe to Notifications Screen

2.15.2.1 Explanation of Email Notification Terms

ID – This is the number assigned by the system to the email notification. This number will appear in the actual email the user receives.

Name – A short description for the specific notification. This name will appear in the actual email the user receives.

Description – This long description is used to explain to the user what the notification is being used for and how/when a bridge will meet the criteria for the notification.

Frequency – The frequency of when the email notification will be sent. Frequencies are daily, weekly, or monthly. For example, new structural priority 0 and 1 notifications are sent the next business day after they reach BMS2. A weekly notification is sent for bridges in status “5 – Ready for Acceptance”.

Date – The date the notification was created or last modified.

Count – The number of bridges within the users jurisdiction that meet the criteria for the notification the last time the notification was run. The notifications typically run prior to the start of the business day based on their frequency. Weekly notifications run on Monday’s and monthly notifications run on the 1st Monday of the month.

Follow-up – The recurrence interval of email notifications after the initial email notification is sent. The notification may be sent one time only (0 days) or it can be set to a number of days (e.g. 5 days, 30 days, 180 days) if the conditions still exist.

Notification Mode – Email notifications can be sent either when the bridge qualifies for a new notification or only with a recurring basis.

2.15.3 Notifications

After a user signs up for notifications, the user can view the most recent run of the notification by expanding the notification list. The notification screen provides the ID, name, description, date, and count for each notification. The screen also shows a magnifying glass for each separate email notification. When the user clicks the magnification glass, a pop-up box providing a list of the bridges that meet the criteria of the notification is provided for the user. The details include the BRKEY, Structure ID, Original Notification Date, and the status of the bridge. Links to the specific bridge are available by clicking either the specific BRKEY or Structure ID. Users can update the status of individual notifications by clicking on the refresh icon. This will not generate email notifications, but it can be used to update the status of notifications before the preset frequency/recurrence intervals execute.

ID	Name	Description	Updated Date	Count	Refresh Status	Action
16	Underwater inspection could not be completed (IN16 = C or D) - STATE	Underwater inspection could not be completed. Inspection by divers or a return to the site during low water needs to be scheduled (IN16 = C or D) - STATE	06/03/2019 06:28:33	263	COMPLETED	
17	Underwater inspection could not be completed (IN16 = C or D) - LOCAL	Underwater inspection could not be completed. Inspection by divers or a return to the site during low water needs to be scheduled (IN16 = C or D) - LOCAL	06/03/2019 06:28:36	35	COMPLETED	
18	Underwater inspection could not be completed (IN16 = C or D) - AMD	Underwater inspection could not be completed. Inspection by divers or a return to the site during low water needs to be scheduled (IN16 = C or D) - AMD	06/03/2019 06:28:40	10	COMPLETED	
19	Structural Priority 0 on STATE Bridge	Priority 0 Structural Maintenance Item on STATE Bridge	06/19/2019 06:15:23	2	COMPLETED	
22	Structural Priority 1 on STATE Bridge	Priority 1 Structural Maintenance Item on STATE Bridge	06/19/2019 06:15:31	280	COMPLETED	

Figure 2.15.3-1 Notification Screen

5A03 BRKEY	5A01 Structure ID	Original Notification Date	Status
53900	37100501501309	07/19/2018	Outstanding
53427	58004901400434	07/26/2018	Outstanding
53573	20040805201643	07/31/2018	Outstanding

Figure 2.15.3-2 Notification Details

2.16 APRAS Data

APRAS Data is used to determine the bridge’s capacity to handle overweight and oversized permit loads. Displayed are widths, heights, and load capacities for each span along the bridge’s length. This screen is accessed using the ‘APRAS Data’ link underneath the Other Links tab. Users with the APRAS Browser or APRAS Edit security level can access this screen of data, but only users with APRAS Edit can edit the data.

2.16.1 APRAS Data Screen

The APRAS Data screen displays information on each individual APRAS Span located on the bridge. Each span can vary in dimensions and what routes/waterways/railroads go underneath. The data for each span is not

editable on this screen – the user must select one of the displayed spans and proceed to a corresponding Detail screen to edit data (assuming the user has the necessary security authorization).

OTHER - APRAS DATA Hide Quick Links

SA01 SR ID:
 SA03 BRKEY:
 Agency ID:
 Go To:

Inventory Links
[Structure Home](#)
[Agency Bridge Features](#)
[Structure Units Drawing Notes](#)
[Structure Group](#)

[Posting Inspection Planning](#)
[Paint Design](#)
[Risk Assessment Detail](#)

Inspection Links
[Ratings & Schedule](#)
[Agency Inspection Notes & Comments](#)
[Element Condition](#)
[Fracture Critical](#)

[Signing Details](#)
[Safety Features](#)
[Load Ratings](#)
[Underwater](#)

Other Links
[Search Structures](#)
[Last Search Results](#)
[EDMS Documents](#)
[Proposed Maintenance](#)
[Completed Maintenance](#)
[BP Assignment](#)

Reports
[Bulletin Board](#)
[Validations](#) ● 0 ⚠ 0 ✔ 0
[Risk Assessment Search](#)
[Last Risk Assessment Search Results](#)
[APRAS Data](#)

APRAS - BRIDGE DATA

SS11 APRAS Ref:
 SS12 Axle Weight: Kips SS13 Total APRAS SPAN:

APRAS - SPANS Records Per Page: 5

Records 1 to 1 of 1 << < > >>

Span Seq No	SS01 Span Id	SS02 Actual Span	SS03 Back Span	SS04 Ident Span	SS05 Beg Cont	SS06 End Cont	SS07 C-C Len ft	SS08 Mom Comp Len	SS09 Dept struc Type	SS10 Notes	Action
1	O1TT			01			125.40		-	BBSS MM TEST	

Figure 2.16.1-1 APRAS Data Screen

2.16.2 APRAS Span Detail

The APRAS Span Detail screen allows users to view and maintain detail and load capacity information about a specific span on the structure. This screen can be accessed in Edit mode by authorized users. Changes to data on this screen are saved to the production BMS2 database.

This screen also contains view only information on Clearances and Permit Conditions that can be accessed and edited by clicking the edit button associated with the corresponding line.

OTHER - APRAS DATA Hide Quick Links

SA01 SR ID:
 SA03 BRKEY:
 Agency ID:
 Go To: Other - APRAS Data

Inventory Links
 Structure Home
 Agency Bridge Features
 Structure Units
 Drawing Notes
 Structure Group

Posting
 Inspection Planning
 Paint
 Design
 Risk Assessment Detail

Inspection Links
 Ratings & Schedule
 Agency Inspection Notes & Comments
 Element Condition
 Fracture Critical

Signing Details
 Safety Features
 Load Ratings
 Underwater

Other Links
 Search Structures
 Last Search Results
 EDMS Documents
 Proposed Maintenance
 Completed Maintenance
 BP Assignment

Reports
 Bulletin Board
 Validations 0 0 0 0
 Risk Assessment Search
 Last Risk Assessment Search Results
 APRAS Data

APRAS - Detail Span Information

Span Seq No: 1	SS07 C-C-Len: <input type="text" value="125.40"/> ft
SS01 Span Id: <input type="text" value="01TT"/>	SS08 Mom Comp Len: <input type="text"/>
SS02 Actual Span: <input type="text" value="Span 1"/>	SS09 Dept Struc Type: -
SS03 Back Span: <input type="checkbox"/>	SS10 Notes: <input type="text" value="BBSS MM TEST"/>
SS04 Ident Span: <input type="text" value="01"/>	SS11 APRAS Ref: <input type="text" value="Test"/>
SS05 Beg Cont: <input type="text"/>	SS12 Axle Weight(Kips): <input type="text" value="-1"/>
SS06 End Cont: <input type="text"/>	SS13 Total APRAS SPAN: <input type="text" value="2"/>

Load Capacity

SL01 Rating Date: By: <input type="text"/>	SL06 POS Mom Comp Factor: <input type="text"/>
SL02 DF Moment Norm: <input type="text"/>	SL07 POS Mom Comp Rest: <input type="text"/>
SL03 DF Moment Single: <input type="text"/>	SL08 Neg Mom Comp Factor Norm: <input type="text"/>
SL04 DF Shear Norm: <input type="text"/>	SL09 Neg Mom Comp Factor Rest: <input type="text"/>
SL05 DF Shear Single: <input type="text"/>	
SL10 Load Condition: <input type="text" value="(blank)"/> <input type="text" value="(blank)"/>	
SL11 Single Lane Span Id: <input type="text"/>	
1st	
SL12 Restrict Span Id: <input type="text"/>	
SL13 Restrict Code: <input type="text" value="(blank)"/> <input type="text" value="(blank)"/> <input type="text" value="(blank)"/>	
2nd	
SL14 Restrict Span Id: <input type="text"/>	
SL15 Restrict Code: <input type="text" value="(blank)"/> <input type="text" value="(blank)"/> <input type="text" value="(blank)"/> <input type="text" value="(blank)"/>	
SL16 Notes: <input type="text"/>	

Clearance

Records 1 to 1 of 1			Records Per Page: 5
SC02 RMS Route	SC03 On/Under Desc	On/Under	Action
- E - 5th Route Under	E - 5th Route Under	E	<input type="button" value="edit"/> <input type="button" value="delete"/>

ESC04 Permit Condition Descriptions

Key	Permit Condition Description	Action
1		<input type="button" value="edit"/>
2		<input type="button" value="edit"/>
3		<input type="button" value="edit"/>
4		<input type="button" value="edit"/>

Figure 2.16.2-1 APRAS Span Detail Screen

2.16.3 APRAS Span Clearance

The APRAS Span Clearance screen allows users to view and maintain vertical and horizontal clearance information about a specific span on the structure. This screen can be accessed in Edit mode by authorized users. Changes to data on this screen are saved to the production BMS2 database.

The screenshot shows the 'OTHER - APRAS DATA' interface. At the top, there are search filters for SA01 SR ID, SA03 BRKEY, and Agency ID, along with a 'Go To' dropdown menu. Below this are three main sections: 'Inventory Links', 'Inspection Links', and 'Other Links', each containing a list of related actions. The main content area is titled 'All Clearance Records for the Structure' and includes a table with columns for SC01 Span Suffix Id, SC02 RMS Route, SC03 On/Under Desc, On/Under, and Action. Below the table is the 'APRAS Span Clearance Information' section, which contains several input fields for SC01 Span Id, SC02 RMS Route, SC03 On/Under Desc, On/Under, Span Seq No, SC05 Non Res Vert Clear, SC06 Non Res Review, SC07 Min Travel Width Left, and SC08 Min Travel Width Right. Further down is the 'Clearance Detail' section with a table for SC09 Horizontal Distance (ft) and SC10 Vertical Distance (ft). Below that is the 'ESC03 Permit' section with dropdown menus for On Loading, Clearance, and Under Clearance. The final section is 'ESC04 Permit Condition Descriptions', which is a table with columns for Key, Permit Condition Description, and Action.

Figure 2.16.3-1 APRAS Span Clearance Screen

2.16.4 APRAS Permit Conditions

The APRAS Permit Conditions edit screen allows users to enter special conditions that issued permits must abide by. The entered information is saved to the production BMS2 database.

The screenshot shows the 'Permit Condition Detail' dialog box. It has a green header with the title and a close button. Below the header is a table with two columns: 'Key' and 'Permit Condition Description'. The first row contains the key '1' and the description 'RUCK TRAFFIC MUST BE KEPT A DISTANCE OF 140 FT FROM PERMIT VEHICL'. At the bottom right of the dialog are two buttons: 'SAVE' and 'CANCEL'.

Figure 2.16.4-1 APRAS Permit Condition Screen

3.0 BMS2 Field Groups

The following is a list of the BMS2 Field Groups. These groupings were established as part of the Pontis system and have remained grouped. For reference in each group, a link to where each field appears in BMS2 has been provided to the user.

Field Groups	Label Prefix	Field Groups	Label Prefix
Inspection Condition	1A	Inventory - Tunnels	VT
Inspection Condition - Create/Edit Element	1B	Inventory - Walls	VW
Inspection Notes	2A	Structure Group	SG
Inspection Work	3A	Inspection - Safety Feature	IA
NBI Project Data	3B	Inspection - Load Rating	IR
Inspection Appraisal - Other Ratings	4A	Inspection - Load Rating - Tunnels	IT
Inspection Appraisal - Load Ratings	4B	Inspection - Fracture Critical	IF
Inspection Inventory - ID/Admin	5A	Inspection - Underwater / OSA	IU
Inspection Inventory - Design	5B	Inspection - Underwater / Sub Units	IN
Inspection Inventory - Roads	5C	Inspection - Underwater / Other	IL
Inspection Inventory - Structure Units	5D	Inspection - Signing Details	ID
Inspection Inventory - Classification	5E	Inspection - Comments	IC
Agency Bridge	6A	Inspection - Maintenance	IM
Agency Inspection	6B	Inspection - Signs / Lights	IS
Agency Roadway	6C	Inspection - Walls	IW
Inspection Schedule	7A	Feature Intersected - Utility	FT
Inventory - Posting	VP	Feature Intersected - Railroad	FR
Inventory - Paint	VA	Feature Intersected - Waterway	FW
Inventory - Maintenance Responsibility	VM	APRAS Span - Span	SP
Inventory - Design	VD	APRAS Span - Apras Span	SS
Inventory - Drawings and Notes	VN	APRAS Span - Load Capacity	SL
Inventory - Inspection Planning	VI	APRAS Span - Clearance - Permit	SC
Inventory - Signs / Lights	VS	APRAS Span - Clearance - Clearance Details	SC

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1A Inspection Condition

The Inspection Condition Screen contains NBI and element-level condition information for the structure. This screen is used to edit condition data, add and remove elements from the structure, and calculate the sufficiency rating or the NBI rating.

Condition Rating Codes Used for the Following Items

To promote uniformity between inspectors, these guidelines will be used to rate and code items 1A01, 1A02, 1A03, 1A04, and 1A05, as well as items 6B38, 6B39, and 6B40.

Condition ratings are used to describe the existing in-place structure as compared to the as-built condition.

Condition codes are properly used when they provide an overall characterization of the general condition of the entire component being rated.

Conversely, they are improperly used if they attempt to describe localized or nominally occurring instances of deterioration or disrepair. Correct assignment of a condition code must, therefore, consider both the severity of the deterioration or disrepair and the extent to which it is widespread throughout the component being rated.

The load carrying capacity will not be used in evaluating condition items. The fact that a bridge was designed for less than the current legal loads and may be posted shall have no influence upon condition ratings.

Portions of the bridges that are being supported or strengthened by temporary members will be rated based on their actual condition; that is, the temporary members are not considered in the rating of the item. (See item 5E03, Temporary Structure Designation, for the definition of a temporary bridge).

Completed bridges not yet open to traffic, if rated, shall be coded as if open to traffic. Even if the bridge is closed, rate each item without being influenced to the fact that the bridge is closed.

The determination of which of the following ratings apply to each of the items will be based on an evaluation of all the relevant factors and information included in the detailed inspection reports. The rating chosen for each of these items will, in effect, be a composite of all the relevant factors.

It should be recognized that this will require judgment, particularly for those items where the ratings seem not to apply. There are unique situations, but again, it is expected that some judgment will be used.

Rating Codes

- N **Not Applicable**
- 9 **Excellent Condition**
- 8 **Very Good Condition** – no problems noted
- 7 **Good Condition** – some minor problems
- 6 **Satisfactory Condition** – structure elements show some minor deterioration
- 5 **Fair Condition** – all primary structure elements are sound but may have minor section loss, cracking, spalling or scour
- 4 **Poor Condition** – advanced section loss, deterioration, spalling or scour
- 3 **Serious Condition** – loss of section, deterioration, spalling or scour may have seriously affected primary structural components. Local failures are possible. Fatigue cracks in steel or shear cracks in concrete may be present.
- 2 **Critical Condition** – advanced deterioration of primary structural elements. Fatigue cracks in steel or shear cracks in concrete may be present or scour may have removed substructure support. Unless closely monitored, it may be necessary to close the bridge until corrective action is taken.
- 1 **“Imminent” Failure Condition** – major deterioration or section loss present in critical structural components or obvious vertical or horizontal movement affecting structure stability. Bridge is closed to traffic but corrective action may put back in light service.
- 0 **Failed Condition** – out of service – beyond corrective action.

Reference: FHWA’s Recording and Coding Guide for the Structural Inventory and Appraisal of the Nation’s Bridges (FHWA Green Book)

Structure Type Coding Item Comparison Chart

Condition:

6B39 Approach Roadway
 6B40 Deck Wearing Surface
 1A01 Deck
 1A04 Superstructure
 1A02 Substructure
 1A05 Channel
 1A03 Culverts

Appraisal:

4A09 Structural Condition Appraisal
 4A10 Deck Geometry
 4A11 Underclearances
 1A06 Waterway Adequacy
 4A02 Approach Roadway Alignment

Structure Type Coding Item Comparison Chart:

			BMS2 ITEM NUMBER												
Structure Type	Grade	Over	6B39	6B40	1A01	1A04	1A02	1A05	1A03	4A09	4A10	4A11	1A06	4A02	
Arch	Culvert	Under Fill	Road	N	N	N	N	N	N	Yes	Yes	(1)	Yes	N	(1)
			Water	N	N	N	N	N	Yes	Yes	Yes	(1)	N	Yes	(1)
	Bridge (Closed Spandrel)	At Grade	Road	(2)	(2)	(2)	Yes	Yes	N	N	Yes	Yes	Yes	N	Yes
			Water	(2)	(2)	(2)	Yes	Yes	Yes	N	Yes	Yes	N	Yes	Yes

Box Culvert	Under Fill	Road	N	N	N	N	N	N	N	Yes	Yes	(1)	Yes	N	(1)
		Water	N	N	N	N	N	N	Yes	Yes	Yes	(1)	N	Yes	(1)
	At Grade	Road	Yes	Yes	N	N	N	N	Yes	Yes	Yes	Yes	Yes	N	Yes
		Water	Yes	Yes	N	N	N	Yes	Yes	Yes	Yes	Yes	N	Yes	Yes

Slab Bridge	Under Fill	Road	N	N	N	Yes	Yes	N	N	Yes	(1)	Yes	N	(1)	
		Water	N	N	N	Yes	Yes	Yes	N	Yes	(1)	N	Yes	(1)	
	At Grade	Road	Yes	Yes	Yes	Yes	Yes	N	N	Yes	Yes	Yes	Yes	N	Yes
		Water	Yes	Yes	Yes	Yes	Yes	Yes	N	Yes	Yes	Yes	N	Yes	Yes

Frame	Culvert	Under Fill	Road	N	N	N	N	N	N	Yes	Yes	(1)	Yes	N	(1)	
			Water	N	N	N	N	N	Yes	Yes	Yes	(1)	N	Yes	(1)	
	Bridge	At Grade	Road	Yes	Yes	Yes	Yes	Yes	N	N	Yes	Yes	Yes	Yes	N	Yes
			Water	Yes	Yes	Yes	Yes	Yes	Yes	N	Yes	Yes	Yes	N	Yes	Yes

Even if the bridge is closed, rate each item without being influenced by the fact that the bridge is closed.

Yes = Code this item numerically

- (1) Required only when parapet, headwalls and/or structure mounted bridge rails restrict the roadway.
- (2) Required only when concrete slab extends beyond the spandrel wall and supports the roadway, sidewalk, and/or parapet. Otherwise, code "N".

N = Code of "N"

***1A01 Deck - Deck Condition Rating**

Inspection > Ratings & Schedule; Form B > Deck & Superstructure

Description:

This item indicates the condition of the bridge deck.

Procedure:

Select the code, which describes the overall condition of the bridge deck.

Concrete decks should be inspected for cracking, scaling, spalling, leaching, chloride contamination, delamination and full or partial depth failures.

Steel grid decks should be inspected for broken welds, broken grids, section loss and growth of filled grids from corrosion.

Timber decks should be inspected for splitting, crushing, fastener failure and deterioration from rot.

Note:

The condition of the wearing surface/protective system, joints, expansion devices, curbs, sidewalks, parapets, fascias, bridge rail, and scuppers shall NOT be considered in the overall deck evaluation. However, their condition should be noted on the inspection form.

Decks integral with the superstructure will be rated as a deck only and not how they may influence the superstructure rating (for example, rigid frame, slab, deck girder or T-beam, voided slab, box girder, etc.). Similarly, the superstructure of an integral deck-type bridge will not influence the deck rating.

For bridge decks with overlays, the inspector must make a judgment from a previous inspection report and/or review underneath the bridge deck for evidence of decay.

Adjacent box beam structures that do not have a separate concrete deck shall have the top flange of the adjacent box beams treated as a deck for the purpose of establishing a deck condition rating. If the box beams have been covered by bituminous wearing surface, the deck rating may be based on:

- The condition of the top of the beams before the wearing surface was placed, if known.
- The condition of the underside of the superstructure.
- Because the condition of the wearing surface gives an indication of the deck condition, the deck condition typically should not be higher than the wearing surface condition rating unless there is strong evidence to support otherwise.

Code “N” for bridges under fill.

Coding:

Refer to CONDITION RATING FOR CONCRETE BRIDGE DECK EVALUATION below.

Note:

The specialized table below can be used as a guide for evaluating deck conditions using different condition indicators.

Condition Rating for Concrete Bridge Deck Evaluation:

Category Classification	Rating	Condition Indicators					
		Deck Area		Electrical Potential	Deck Area	Chloride Content (#/CY)	Deck Area
		Visible Spalls	Delamination				
Category #3 Light Deterioration	9	none	none	0.0	none	0	none
	8	none	none	0.0 < E.P. < 0.35	none	0 < C.C. < 1	none
	7	none	< 2%	0.35 < E.P. < 0.45	≤ %5	0 < C.C. < 2	none
Category #2 Moderate Deterioration	6	< 2% spalls or sum of all deteriorated and/or contaminated deck concrete (≥2#/C.Y.Cl) < 20%					
	5	< 5% spalls or sum of all deteriorated and/or contaminated deck concrete 20% to 40%					
Category #1 Extensive Deterioration	4	> 5% spalls or sum of all deteriorated and/or contaminated deck concrete 40% to 60%					
	3	> 5% spalls or sum of all deteriorated and/or contaminated deck concrete > 60%					
Structurally Inadequate Deck	2	Deck structural capacity grossly inadequate					
	1	Deck has failed completely - Repairable by replacement only					
	0	Holes in deck - Danger of other sections of deck failing					

Notes: Rating 9 - No deck cracking exists. Rating 8 - Some minor deck cracking is evident

*1A02 Substructure - Substructure Condition Rating

Inspection > Ratings & Schedule; Form C

Description:

This item indicates the condition of the bridge substructure.

Procedure:

Select the code which indicates the condition of the bridge substructure. This includes backwall abutments, integral wings, piers, piles, fenders, and footing scour conditions or other.

All substructure elements should be inspected for visible signs of distress including evidence of cracking, section loss, settlement, misalignment, scour, collision damage, and corrosion. The rating factor given to 1A02 should be consistent with the one given to 4A08 whenever a rating factor of 2 or below is determined for 4A08 - Scour Critical Bridge Indicator.

The substructure condition rating shall be made independent of the deck and superstructure.

Include integral wingwalls to the first construction or expansion joint in the evaluation. For non-integral superstructure and substructure units, the substructure is considered to be the portion below the bearings. For structures where substructure and superstructure are integral, the substructure is considered to be the portion below the springline.

Coding:

Refer to CONDITION RATING CODES listed at the beginning of Section 1A.

*1A03 Culvert - Culvert Condition Rating

Inspection > Ratings & Schedule; Form H

Description:

This item indicates the condition of a culvert.

Procedure:

Select the code which indicates the condition of the culvert. This includes alignment, settlement problems, joints, structural condition, scour and structural integrity of culverts. Integral wingwalls to the first construction or expansion joint shall be included in the evaluation.

For a detailed discussion regarding the inspection and rating of culverts, consult Report No. FHWA-IP-86-2, Culvert Inspection Manual, July 1986.

Coding:

Refer to Appendix G for the coding of 1A03 for stone masonry arches. For other culvert structure types, rate and code the condition in accordance with the previously described general condition ratings and the following descriptive codes:

- N Not applicable. Use if structure is not a culvert.
- 9 No deficiencies.
- 8 No noticeable or noteworthy deficiencies which affect the condition of the culvert. Insignificant scrape marks caused by drift.
- 7 Shrinkage cracks, light scaling, and insignificant spalling which does not expose reinforcing steel. Insignificant damage caused by drift with no misalignment and not requiring corrective action. Some minor scouring has occurred near curtain walls, wingwalls or pipes. Metal culverts have a smooth, symmetrical curvature with superficial corrosion and no pitting.
- 6 Deterioration or initial disintegration, minor chloride contamination, cracking with some leaching, or spalls on concrete or masonry walls and slabs. Local minor scouring at curtain walls, wingwalls or pipes. Metal culverts have a smooth curvature, non-symmetrical shape, significant corrosion or moderate pitting.
- 5 Moderate to major deterioration or disintegration, extensive cracking and leaching, or spalls on concrete or masonry walls or slabs. Minor settlement or misalignment. Noticeable scouring or erosion at curtain walls, wingwalls or pipes. Metal culverts have a significant distortion and deflection in one section, significant corrosion or deep pitting.
- 4 Large spalls, heavy scaling, wide cracks, considerable efflorescence, or opened construction joint permitting loss of backfill. Considerable settlement or misalignment. Considerable scouring or erosion at curtain walls, wingwalls or pipes. Metal culverts have a significant distortion and deflection throughout, extensive corrosion or deep pitting.
- 3 Any condition described in Code 4 but which is excessive in scope. Severe movement or differential settlement of the segments, or loss of fill. Holes may exist in walls or slab. Integral wingwalls nearly severed from culvert. Severe scour or erosion at curtain walls, wingwalls or pipes. Metal culverts have extreme distortion and deflection in one section, extensive corrosion, or deep pitting with scattered perforations.
- 2 Integral wingwalls collapsed, severe settlement of roadway due to loss of fill. Section of culvert may have failed and can no longer support embankment. Complete undermining at curtain walls and pipes. Corrective action required to maintain traffic. Metal culverts have extreme distortion and deflections throughout with extensive perforations due to corrosion.
- 1 Bridge closed. Corrective action may put back in light service.
- 0 Bridge closed. Replacement necessary.

*1A04 Superstructure - Superstructure Condition Rating

Inspection > Ratings & Schedule; Form B > Deck & Superstructure

Description:

This item indicates the condition of the bridge superstructure.

Procedure:

Select the code which indicates the condition of the bridge superstructure. The structural members should be inspected for signs of distress which may include cracking, deterioration, section loss, and malfunction and misalignment of bearings. The condition of bearings, joints, paint system, etc., shall not be included in this rating, except in extreme situations, but should be noted on the inspection form.

When the deck is the superstructure (slab bridges) or is an integral (composite) part of the superstructure (beams), base the condition rating on both the deck slab and the beams.¹ Otherwise, base it on the superstructure, excluding the deck.

Coding:

Refer to CONDITION RATING CODES listed at the beginning of Section 1A.

Refer to Appendix G for the coding of 1A04 for stone masonry arches.

Superstructure condition rating guidelines for Non-Composite Prestressed Concrete Adjacent Box Beams are in the table below. The use of this table is a departure from the normal condition rating procedure which is based on an overall characterization of the general condition of the entire component being rated. Instead, base the overall rating of the superstructure for this bridge type on the **lowest condition rating** of any single beam’s strand exposure or deterioration in accordance with the following table:

Condition Rating	Percent # Strands Exposed (single beam)	Deterioration of P/S Concrete Beams	
9 - Excellent	0%		No cracks, stains or spalls
8 - Very Good	0%		No cracks, stains or spalls
7 - Good	0%		Map cracks and miscellaneous hairline cracks
6 - Satisfactory	0%	Spalls	Minor Spalls/Delaminations, < 5%
		Cracks	Map cracks and misc. hairline cracks
5 - Fair	1-5%	Spalls	Spalls/Delaminations, < 15%
		Longitudinal Cracks	Hairline longitudinal cracks in bottom flange
		Longitudinal Joints	Leakage at joints with light efflorescence
4 - Poor	6-15%	Spalls	Spalls/Delaminations, 15 - 25%
		Transverse Cracks	Hairline flexure cracks across bottom flange
		Longitudinal Cracks	Minor efflorescence and/or minor rust stains
		Longitudinal Joints	Heavy efflorescence and/or minor rust stains
		Transverse Tendons	Loose or heavily rusted
		Web Cracks	Initiation of vertical or diagonal cracks in P/S beam near open joints in barrier (< 3" length)
3 - Serious	15-20%	Spalls	Spalls/Delaminations, > 25%
		Transverse Cracks	Open flexure cracks in bottom flange
		Web Cracks	Vertical or diagonal cracks in P/S beam near open joints in barrier
		Camber	Sagging/Loss of camber
		Transverse Tendons	Broken or missing
2 - Critical	> 20%	All	Any condition worse than detailed above

Note:

This item is not applicable for a reinforced concrete box culvert at grade.

¹This is true for Deck Condition Rating 1A01 ≤ 4.

***1A05 Channel - Channel and Channel Protection Condition Rating**

Inspection > Ratings & Schedule; Form J

Description:

This item indicates the condition of the channel and channel protection.

Procedure:

Select the code which indicates the condition of the channel and channel protection. This includes stability and condition of rip-rap, spur dike, etc. Accumulation of drift and debris on the superstructure and substructure should be noted on the inspection form but not included in the condition code rating.

Coding:

Rate and code the condition in accordance with the previously described general condition ratings and the following condition codes:

- | | |
|---|--|
| N | Not applicable. Use when bridge is not over a waterway. |
| 9 | There are no noticeable or noteworthy deficiencies which affect the condition of the channel. |
| 8 | Banks are protected or well-vegetated. River control devices such as spur dikes and embankment protection are not required or are in stable condition. |
| 7 | Bank protection is in need of minor repairs. River control devices such as spur dikes and embankment protection have little or minor damage. Banks and/or channel have minor amounts of drift. |
| 6 | Bank is beginning to slump. River control devices and embankment protection have widespread minor damage. There is minor stream bed movement evident. Debris is restricting the water (channel) slightly. |
| 5 | Bank protection is being eroded. River control devices and/or embankment have major damage. Trees and brush restrict channel |
| 4 | Bank and embankment protection is severely undermined. River control devices have severe damage. Large deposits of debris are in the waterway (channel). |
| 3 | Bank protection has failed. River control devices have been destroyed. Stream bed aggradation, degradation, or lateral movement has changed the waterway (channel) to now threaten the bridge and/or approach roadway. |
| 2 | The waterway (channel) has changed to the extent the bridge is near a state of collapse. |
| 1 | Bridge closed because of channel failure. Corrective action may put back in light service. |
| 0 | Bridge closed because of channel failure. Replacement necessary. |

***1A06 Waterway - Waterway Adequacy Appraisal**

Inspection > Ratings & Schedule; Form J

Description:

This item indicates the appraisal of the bridge waterway adequacies.

Procedure:

This item appraises the waterway opening with respect to passage of flow through the bridge. The following codes shall be used in evaluating waterway adequacy. Site conditions may warrant somewhat higher or lower ratings than indicated by the table (e.g., flooding of an urban area due to a restricted bridge opening).

Where overtopping frequency information is available, the descriptions given in the table for chance of overtopping mean the following:

Remote	Greater than 100 years
Slight	11-100 years
Occasional	3 to 10 years
Frequent	Less than 3 years

Adjectives describing traffic delays mean the following:

Insignificant	Minor inconvenience. Highway passable in a matter of hours.
Significant	Traffic delays of up to several days.
Severe	Long term delays to traffic with resulting hardship.

Coding:

Refer to Table 4A below.

**TABLE 4A
Rating by Functional Classification of Overtopping Frequency and/or Traffic Delays**

Functional Classification, 5C22			Description
Principal Arterials - Interstates, Freeways or Expressways	Other Principal & Minor Arterials & Major Collectors	Urban Collectors, Minor Collectors, Locals	
Code			
N	N	N	Bridge not over a waterway
9	9	9	Bridge deck and roadway approaches above flood water elevations (high water); chance of overtopping is remote
8	8	8	Bridge deck above roadway approaches; slight chance of overtopping roadway approaches
6	6	7	Slight chance of overtopping bridge deck and roadway approaches
4	5	6	Bridge deck above roadway approaches; occasional overtopping of roadway approaches with insignificant traffic delays
3	4	5	Bridge deck above roadway approaches; occasional overtopping of roadway approaches with significant traffic delays
2	3	4	Occasional overtopping of bridge deck and roadway approaches with significant traffic delays
2	2	3	Frequent overtopping of bridge deck and roadway approaches with significant traffic delays
2	2	2	Occasional or frequent overtopping of bridge deck and roadway approaches with severe traffic delays
0	0	0	If this item is the reason for closure

Note: This Table refers to items 1A06 and 5C22.

1A07 Unrep Spalls - Unrepaired Spalls

Inspection > Ratings & Schedule; Form B > Deck & Superstructure

Description:

This item indicates the actual unrepaired spalled area in the top of deck, measured in square feet.

Procedure:

Enter the total spalled area in the top of deck to the nearest square foot.

1A08 (Not Used - Reserved for Future Use)

1A09 Status - Inspection Status

Inspection > Ratings & Schedule; iForms Header

Description:

This item indicates the status of the inspection.

Definitions used in the inspection status process include:

SUBMITTED Indicates that the inspection information is now in BMS2. Further review by the inspector may be needed before it is ready for the ACCEPTANCE review.

ACCEPTED The Department’s acceptance of the inspection report after its review. The ACCEPTANCE review is a detailed review by a Department Inspection Reviewer of all BMS2 data, inspection comments and documentation for conformance with PennDOT standards and NBIS. To assist with the review of BMS2 data prior to moving the inspection record to Accepted status, the key field comparison section highlights differences from the current inspection record to the previous inspection record for certain inspection condition ratings and appraisals as well as required inspection checkboxes and frequencies.

See Pub 238 IP 06 for more details on the review process.

Procedure:

Select the appropriate inspection status indicator from the dropdown list.

Coding:

1A09 Coding		
0 - Ready to submit upload	This status occurs only in iForms. The inspection information is in iForms only and has not yet been uploaded to BMS2 Web.	Inspection Team and its internal reviews
1 - New	This 1A09 = 1 status occurs when a new inspection is started in iForms (not BMS2). The inspection information displayed is new and has not been submitted for ACCEPTANCE.	
2 - Submitted	The inspection information was submitted to BMS2. The inspection team’s self-review is not yet complete and the inspection is complete for ACCEPTANCE review. Review for ACCEPTANCE has not been started.	
3 - Under Review	The inspection information was submitted and is currently under review by the inspection team. All fields in iForms are read-only if a bridge is downloaded in this status.	
4 - Validation Failure	This status occurs only in iForms. The inspection information attempted to be uploaded but validation errors and/or failures must be corrected before the record can be uploaded to BMS2.	
5 - Ready for Acceptance Review	The inspection is complete and ready for the Acceptance Review by the Department’s Inspection Reviewer.	Department Acceptance Inspection Reviewer
6 - Interim Final Review	The submitted inspection is under review for Acceptance by the Department’s Inspection Reviewer.	
8 - Returned for Correction	The inspection was submitted for ACCEPTANCE and was rejected after review by a Department Inspection Reviewer. The inspection originator is to make corrections and re-submit for ACCEPTANCE.	
9 - Accepted	The inspection has been reviewed and ACCEPTED by the Department’s Inspection Reviewer.	

Other notes and comments:

- All inspections being prepared in iForms should be submitted to BMS2 Web at the end of the day it was started to ensure inspection dates are recorded for inspection frequency compliance.
- The 1A09 = 2 Submitted status allows the Department to establish a Plan of Action for critical findings in BMS2 and SAP immediately.

1A09a Inspection Reviewer

Inspection > Ratings & Schedule

Description:

This item is used to record the name of the inspection reviewer who accepted the inspection.

Procedure:

This item will be automatically populated by the system when the user moves the inspection status (1A09) to accepted.

Coding:

Name of inspection reviewer who accepted the inspection.

1A10 Qty - Element Quantity

Inspection > Element Condition > Inspection Element Detail; Form E

Description:

This item is used to record the total quantity for the corresponding element.

Procedure:

Enter the total quantity for the element. The unit of measure will vary by element and is displayed to the right of the Quantity field. For elements measured in linear feet (LF), record the quantity to the nearest tenth of a foot.

Coding:

Refer to Appendices H, I & J for guidance on coding element quantities.

1A11 Qty1 / Qty2 / Qty3 / Qty4

Inspection > Element Condition > Inspection Element Detail; Form E

Description:

This four-part item is used to record the quantity of the element in each condition state, 1 through 4.

Procedure:

Enter the quantity for the element in condition states 2 through 4. The quantity in condition state 1 will be automatically calculated by the system by subtracting the quantities in condition states 2 through 4 from the total quantity (1A10).

Coding:

Refer to Appendices H, I & J for guidance on coding element quantities.

1A12 Elem Cond - Element Condition

Inspection > Element Condition > Inspection Element Detail; Form E

Description:

This item is used to record notes about the condition of the currently selected element.

Procedure:

Enter notes about the condition of the currently selected element. Click on the pencil icon beside the comment to open the Notes screen.

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1B Inspection Condition - Create/Edit Element

The Inspection Condition - Create/Edit Element Screen is used to add a new element to a structure, or view and edit detailed information about a selected element.

In order to avoid internal errors within BMS2, each structure was assigned a "Dummy Element" (Element 999). When a structure has its actual elements defined, the Dummy Element should be removed.

1B01 Element ID

Inspection > Element Condition > Inspection Element Detail; Form E

Description:

This item indicates the desired element for the condition unit.

Procedure:

Select the desired element from the dropdown list.

Refer to Appendices H, I & J for guidance on coding element quantities.

1B02 Structure Unit

Inspection > Element Condition > Inspection Element Detail; Form E

Description:

This item indicates the structure unit on which the element is located.

Procedure:

Select the appropriate structure unit from the dropdown list. If left blank, the new element will be assigned to the default structure unit defined in item 5D05. Elements shared by two structure units (e.g. piers) should be assigned to the lower numbered unit (span). Elements shall only be assigned to Main and Approach Span structure units.

If a new structure unit is required, it must be created on screen 5D Inspection Inventory - Structure Units in order to appear in the dropdown list. Refer to Item 5D04 for Structure Unit types.

For elements that are spread over multiple spans, create the element for each structure unit where it is located. The quantity for the element shall represent the quantity for that individual structure unit.

1B03 Environment

Inspection > Element Condition > Inspection Element Detail; Form E

Description:

This item indicates the environment for the condition unit.

Procedure:

Select the appropriate environment for the condition unit.

Factors affecting environment include climate, salt use, and ADT.

Coding:

Four standard environments are available; however, **all Pennsylvania bridge elements should be coded with environment 3 - moderate.**

- 1 Benign (not used)
- 2 Low (not used)
- 3 Moderate
- 4 Severe (not used)

1B04 (Not Used – Reserved for Future Use. Use Item 1A10)**1B05 Scale Factor**

Inspection > Element Condition > Inspection Element Detail; Form E

Description:

This item is used to record the scale factor of the element in this structure unit.

Procedure:

Enter the scale factor for the element.

Scale factor is an additional dimension field used to measure the element for developing project-level cost estimates.

Scale factors should be recorded to the nearest foot or tenth of a foot, depending on the element. For elements without scale factors, enter 1.00 for not applicable.

Coding:

Enter the Scale Factor Measurement for applicable elements. Refer to Appendices H, I & J for guidance on coding element quantities.

1B06 (Not Used - Reserved for Future Use)**1B07 Element Desc - Element Description**

Inspection > Element Condition > Inspection Element Detail; Form E

Description:

This item is used to record a short description (up to 255 characters) of the element.

Procedure:

Enter a short description of the condition unit in narrative form.

Examples:

"Element record added 2006-02-08"

"Manufacturer: XYZ Company Model #:ABC123"

"Element 28 - Steel Open Grid has been replaced with Element 26 - Concrete with Coated Bars after deck rehab on 12/10/2006"

2A Inspection Notes

The Inspection Notes Screen is used to enter notes or comments about the structure, or about the current inspection.

2A01 Str Notes - Structure Notes

Inventory > Structure Home

Description:

This item is used to record notes about the structure in narrative form.

Procedure:

Record any narrative information about the structure that may be useful for future applications.

2A02 Insp Notes - Inspection Notes

Inspection > Notes & Comments; Form P > Current Overall Inspection Notes

Description:

This item is used to record notes about the inspection in narrative form.

Procedure:

Record any narrative information that is necessary to identify inspection findings.

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3A Inspection Work

The Inspection Work Screen is used to recommend work candidates for the bridge, and to edit or remove those work candidates.

3A01 (Not Used - Reserved for Future Use)

3A02 Cand ID - Candidate ID

Other > Proposed Maintenance; Other > Completed Maintenance; Form M

Description:

This item is used to record a unique ID for the current work candidate.

Procedure:

A new ID is assigned automatically by the system when a new work candidate is created. This ID may be changed, but no two work candidates on any bridge or element may have the same ID.

Coding:

This automatically generated ID should not be changed.

3A03 Structure Unit

Form M

Description:

This item is used to select which structure unit on the bridge to which the work candidate applies.

Procedure:

Select the structure unit from the drop down list for which the maintenance item is applicable for. If the maintenance item applies to multiple spans, select the location that drives the level of the priority. In the instance where the level of priority applies to all spans of a structure, select "All Units."

Coding:

The list is populated from units in 5D01. Select the appropriate coding from the drop down list.

3A04 (Not Used - Reserved for Future Use. Use Item IM04)

3A05 (Not Used - Reserved for Future Use. Use Item IM02)

3A06 (Not Used - Reserved for Future Use. Use Item IM03)

3A07 (Not Used - Reserved for Future Use. Use Item IM10)

3A08 (Not Used - Reserved for Future Use. Use Item IM05)

3A09 (Not Used - Reserved for Future Use. Use Item IM06)

3A10 (Not Used - Reserved for Future Use)

3A11 (Not Used – Reserved for Future Use. Use Item IM08)

3A12 (Not Used – Reserved for Future Use)

3A13 (Not Used – Reserved for Future Use. Use Item IM11)

3A14 (Not Used – Reserved for Future Use. Use Item IM07)

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3B NBI Project Data

The NBI Project Data Screen is used to view and update the NBI fields related to planned projects for a structure. To access this information, select the "Proposed Maintenance" screen under Other Links.

*3B01 Proposed Deck/Super Work

Other > Proposed Maintenance

Description:

This item is used to indicate the type of major deck and superstructure work proposed to be accomplished on the structure to improve it to the point that it will provide the type of service needed.

Procedure:

This item must be coded for bridges eligible for the Highway Bridge Replacement and Rehabilitation Program. To be eligible, a bridge must carry highway traffic, be deficient and have a sufficiency rating of 80.0 or less.

Select the code that indicates the type of work proposed.

Coding:

The deck and superstructure coding values have been combined in BMS2 as a two digit value. Any combination of the deck and superstructure coding values may be selected from the dropdown list.

Code	Deck Work		Superstructure Work
0	Do Nothing	0	Do Nothing
1	Rehabilitate concrete deck (patch, membrane, bituminous wearing surface)	1	Rehabilitate (minor)
2	Rehabilitate concrete deck (patch and latex, concrete or other wearing surface)	2	Rehabilitate (extensive)
3	Replace with concrete deck	3	Widen Bridge
4	Replace with steel grid deck	4	Widen bridge and superstructure rehabilitation
5	Replace with timber deck	5	Widen bridge and extensive superstructure rehabilitation
6	Replace deck (as component of superstructure replacement)	6	Replace

Example:

<u>Proposed Work</u>	<u>Code</u>
Replace deck and superstructure	66

Note:

Generally when a rehabilitation and/or widening code is specified, it is presumed that the component can and will be upgraded to remove any structural deficiency, that it will have a minimum 20 year life, and condition ratings of each structural component will be 7 or greater.

***3B02 Proposed Sub Work**

Other > Proposed Maintenance

Description:

This item is used to indicate the type of substructure work proposed to be accomplished on the structure to improve it to the point that it will provide the type of service needed.

Procedure:

Select the appropriate code from the dropdown list.

Coding:

- 0 Do nothing
- 1 Rehabilitate (minor)
- 2 Rehabilitate (extensive)
- 3 Replace Portion
- 4 Replace Major Portion
- 6 Replace
- 8 Rehabilitate Culvert
- 9 Replace with Culvert

Note:

Generally when a rehabilitation and/or widening code is specified, it is presumed that the component can and will be upgraded to remove any structural deficiency, that it will have a minimum 20 year life, and condition ratings of each structural component will be 7 or greater.

***3B03 Improvement Length**

Other > Proposed Maintenance

Description:

This item is used to record the length of the proposed structure improvement.

Procedure:

For replacement or rehabilitation of the entire bridge, enter the total length of the structure to the nearest foot. This will normally be the overall length measured along the centerline of roadway from paving notch to paving notch or back to back of backwalls of abutments, if present. Otherwise, end to end of the bridge floor, but in no case less than the total clear opening of the structure. For replacement or rehabilitation of only part of the structure, use the length of the portion to be improved.

For culverts, including single or multiple boxes or pipes, etc., where the clear distance between multiple openings is less than half of the smaller contiguous opening, the measurement should be made between inside edges of the exterior pipes or inside faces of the exterior walls, if any, along the centerline of roadway regardless of their depth below grade. For culverts at grade (e.g., R.C. Box Culvert without fill), the measurement should be along the centerline of roadway from paving notch to paving notch, if any, or back to back of exterior walls (see sketches for item 5B18). If the structure is highway tunnel, enter the length of the tunnel measured along the centerline of the roadway.

Coding:

Length of the proposed structure improvement to the nearest foot.

***3B04 Improvement Cost - Bridge Improvement Cost**

Other > Proposed Maintenance

Description:

This item is used to record the estimated cost of bridge or major structure improvements. This item is to be completed for all bridges eligible for the Highway Bridge Replacement and Rehabilitation Program.

Procedure:

This cost shall include only bridge construction costs, excluding roadway, right-of-way, detour, demolition, preliminary engineering, etc.

Coding:

Cost of structure improvement in \$1000's

***3B05 Roadway Improvement Cost**

Other > Proposed Maintenance

Description:

This item is used to record the estimated cost of the approach roadway improvements that are included in the structure improvement project cost. This item is to be completed for all bridges eligible for the Highway Bridge Replacement and Rehabilitation Program.

Procedure:

This cost shall include only roadway construction costs, excluding bridge, right-of-way, detour, extensive roadway realignment costs, preliminary engineering, etc.

Coding:

Cost of the improvements to the roadway in \$1000's.

***3B06 Total Cost - Estimated Total Cost of Overall Improvement Project**

Other > Proposed Maintenance

Description:

This item is used to record the estimated cost of the structure improvement project based on the user defined Type Work. This item is to be completed for all bridges eligible for the Highway Bridge Replacement and Rehabilitation Program.

Procedure:

This item should include all costs normally associated with the proposed bridge improvement project. The Total Project Cost will therefore usually be greater than the sum of items 3B04 and 3B05.

Coding:

Total cost of the overall structure improvement project in \$1000's.

***3B07 Year of Estimate - Year of Improvement Cost Estimate**

Other > Proposed Maintenance

Description:

This item is used to record the base year of improvement cost estimates.

Procedure:

Enter the appropriate year that corresponds to the costs.

Coding:

Year of estimated costs.

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4A Inspection Appraisal - Other Ratings

The Inspection Appraisal - Other Ratings Screen contains information related to the appraisal of the structure, as well as to clearances and navigation data.

Appraisal Rating Codes Used For the Following Items

The intention of the "Appraisal" Section is to evaluate a bridge in relation to the highway system and functional classification of which the bridge is a part. The individual deficiencies in the various related items need to be evaluated as to how they affect the bridge as a unit. The structure then would be compared to a new one built to the Department's current standards for that particular road. On this basis, it is not always necessary to use the highest standard, but, it is not recommended to use unduly low standards. It is recommended that AASHTO standards be followed for establishing a design, minimum adequate and intolerable categories, unless the Department's approved criteria differ from those in the AASHTO guides.

Those portions of the bridges that are being supported or strengthened by temporary members will be rated based on their actual condition, i.e., the temporary members are not considered in the rating of the item. The determination of which of the above ratings apply to each of the items will be based on an evaluation of all the relevant factors and information that are included in the detailed inspection reports. The rating chosen for each item will, in effect, be a composite of all the relevant factors. It should be recognized that this will require judgment, particularly for those items where the ratings seem not to apply. It is recognized that there are unique situations, but, again, it is expected that some judgment will be used.

Appraisal Rating Codes

N	Not Applicable
9	Condition superior to present desirable criteria
8	Condition equal to present desirable criteria
7	Condition better than present minimum criteria
6	Condition equal to present minimum criteria
5	Condition somewhat better than minimum adequacy to tolerate being left in place as is
4	Condition meeting minimum tolerable limits to be left in place as is
3	Basically intolerable condition requiring high priority of corrective action
2	Basically intolerable condition requiring high priority of replacement
1	Immediate repair necessary to put back in service
0	Immediate replacement necessary to put back in service (Bridge Closed)

Reference: FHWA's Recording and Coding Guide for the Structural Inventory and Appraisal of the Nation's Bridges

Note: Refer to the Structure Type Coding Item Comparison Chart on Page 3-5 for use of "N".

***4A01 Open/Posted/Closed - Is the Bridge Open, Posted, or Closed?**

Not Displayed in BMS2

Description:

This item provides information about the actual operational status of a structure. The field review could show that a structure is posted, but data item 4B03, Bridge Posting, may indicate that posting is not required. This is possible and acceptable coding since item 4B03 is based on the operating stress level and the governing agency's posting procedures may specify posting at some stress level less than the operating rate.

Procedure:

This item will be automatically filled in by the system based on information entered in item VP02.

***4A02 Approach Alignment - Approach Roadway Alignment Appraisal**

Inspection > Ratings & Schedule; Form A > Approach Roadway

Description:

This item indicates appraisal of the approach roadway alignment.

Procedure:

Code the rating based on the adequacy of the approach roadway alignment. This item identifies those bridges which do not function properly or safely due to the alignment of the approaches. The basic criterion is how alignment of the roadway approaches to the bridge relates to the general highway alignment for the section of the highway the bridge is on.

It is not intended that approach roadway alignment be compared to current standards, but rather to the existing highway alignment. This concept differs from other appraisal evaluations. For example, if the highway section requires a substantial speed reduction due to vertical or horizontal alignment, and the roadway approach to the bridge requires only a minor speed reduction at the bridge, the appropriate code is 6. This concept shall be used at each bridge site.

A bridge would rarely, if ever, be replaced due to approach roadway alignment, but a bridge should be classified as obsolete when its approaches are such that they can no longer safely serve today's traffic.

The individual structure shall be rated in accordance with the general appraisal rating guide in lieu of specific design values. The approach roadway alignment will be rated intolerable (a code of 3 or less) only if the horizontal or vertical curvature requires a substantial reduction in the vehicle operating speed from that on the highway section.

A very minor speed reduction will be rated 6.

When a speed reduction is not required, the appraisal code is 8. Additional codes may be selected between general values. Therefore, consideration may be given to the vertical sight distances and sharp right angle type horizontal curves on the approach to and from the bridge. Speed reduction necessary because of structure width and not alignment shall not be considered in evaluating this item.

Coding:

- N Not Applicable (Refer to Structure Type Coding Item Comparison Chart on Page 3-5)
- 8 No Speed reduction
- 7 *Slight limited sight distance, with no speed reduction*
- 6 Very minor speed reduction
- 5 *Limited sight distance, with minor speed reduction*
- 4 Considerable speed reduction for bridge, but tolerable for route carried
- 3 Substantial speed reduction, intolerable for route carried
- 0 If this item is the reason for closure
- Non-italics indicate original FHWA coding. Records of accidents and/or damage to guiderail attributed to poor alignment should be considered.

4A03 (Not Used – Reserved for Future Use. Use IA02)

4A04 (Not Used – Reserved for Future Use. Use IA02)

4A05 (Not Used – Reserved for Future Use. Use IA02)

4A06 (Not Used – Reserved for Future Use. Use IA02)

***4A07 Pier Protection – Dolphins & Fenders**

Inspection > Ratings & Schedule; Form D

Description:

This item indicates the status of navigation protection.

Procedure:

If data item 4A21, Navigation Control, has been coded "1", use the codes below to indicate the presence and adequacy of pier or abutment protection features such as fenders, dolphins, etc. The condition of the protection devices may be a factor in the overall evaluation of data item 1A02, Substructure.

If data item 4A21, Navigation Control, has been coded "0" or "N", select a coding of N for this field.

Coding:

- 1 Navigation protection not required
- 2 In place and functioning
- 3 In place but in a deteriorating condition
- 4 In place but reevaluation of design suggested
- 5 None present but reevaluation suggestion
- N Not applicable (4A21 = 0 or N)

*4A08 Scour Critical - Scour Critical Bridge Indicator

Inspection > Underwater; Form G

Description:

This item indicates the current status of the bridge regarding its vulnerability to scour and an appropriate code is determined based on one of two methods; computed or observed:

(1) Computed: By assigning a code based on the presence of foundations or scour measures that were designed in accordance with the results of scour calculations/analyses that are part of a Hydrologic and Hydraulic (H & H) analysis performed by hydraulic/foundation engineers. The observed scour conditions during the inspection match the design conditions described previously. To ensure these conditions match, the IN fields on the Sub-Unit detail screen must be filled out completely for all sub-units within the 500-year flood plain.

(2) Observed: By utilizing field observations and the Scour Calculator in BMS2 or iForms. The Scour Calculator is an algorithm (step-by-step procedure) that determines an appropriate Scour Critical Bridge Indicator (SCBI) code utilizing certain item IN codes that have been determined from field observations and bridge plans. A scour critical bridge (SCBI code ≤ 3) is one with abutment or pier foundations which are rated as unstable due to (1) observed scour at the bridge site or (2) a scour potential as determined from a scour evaluation study.

Procedure:

Select the code that indicates the current status of the bridge regarding its vulnerability to scour if Item IU03 – SCBI Source is Computed. When IU03 is set to Observed, Item 4A08 is automatically set equal to Item IU04 – Overall SCBI. The scour calculator should be run during every Routine, Underwater, or any other inspection type where the substructure or channel is evaluated.

Whenever a rating factor is "4" or below for this item, item 1A02 (substructure condition rating) may need to be revised to reflect the severity of actual scour and resultant damage to the bridge. The substructure condition may need to be revised when advanced or serious scour is present which has compromised the structural integrity of the abutment (i.e., the scour has undermined the footing and reduced the bearing capacity, or the scour has caused settlement and cracking in the substructure).

Whenever a rating factor is "2" or below for this item, item 1A02 or 1A03 (culvert condition rating) must be equal to or less than this rating (Ref: FHWA Memo dated April 27, 2001).

For foundations on rock where scour cannot be calculated, use the coding most descriptive of site conditions.

Notes:

Additional clarification comments to the FHWA coding for this item appear in italicized print.

Coding:

N	Bridge not over waterway – <i>bridge over highway, railroad grade crossing, etc., Signs, Walls, Lights, or other non-Bridge structures</i>
9	Bridge foundations (including piles) on dry land well above flood water elevation - <i>high gorge structure, abutment and/or piers well set back from the main channel (above/outside 500-yr flood elevation), bridge over concrete or gabion lined channel.</i>
8	Bridge foundations determined to be stable for assessed or calculated scour conditions (<i>H & H analysis</i>); Scour is determined to be above the top of the footing by assessment (i.e., bridge foundations are on rock formations that have been designed to resist scour within the service life of the bridge), by calculation (<i>H & H analysis</i>) or by installation of properly designed scour measures (see HEC 23 or DM-4, PP Chapter 7) – <i>Designed foundations or as determined through field observation and the use of the Scour Calculator; Culverts assessed as low risk during USGS scour screening (i.e., culverts with integral bottom such as box culverts).</i>

7	Countermeasures have been installed to mitigate an existing problem with scour and to reduce the risk of bridge failure during a flood event. Instructions contained in a plan of action have been implemented to reduce the risk to users from a bridge failure during or immediately after a flood event. <i>As determined through field observation and the use of the Scour Calculator; countermeasures (non-designed placed rock, scour walls, etc.) have mitigated the existing scour problem. These bridges still require a Scour Plan of Action and require evaluation after certain flood events as defined in the Plan of Action.</i>
6	Scour calculation/evaluation has not been made. (Use only to describe case where bridge has not yet been evaluated for scour potential). <i>Item 4A08 shall not have a value of '6'. A code of '6' resulting from a Scour Calculator run is an indication of incorrect or incomplete data entry for BMS2 items on the IN Inspection – Underwater Sub Units Tab that are utilized by the Scour Calculator algorithm to determine the appropriate SCBI code. Examples of incorrect or incomplete data entry include incompatible, incomplete, or blank substructure (abutment/pier) or foundation types. This is outlined in the USGS Open-File Report 00-64 titled "Procedures for Scour Assessment at Bridges in Pennsylvania", which is available here:</i> http://www.dot.state.pa.us/public/Bureaus/design/bqad/Pubs/Procedures-for-Bridge-Scour-Assessments.pdf . <i>This is also outlined in the SCBI Scour Calculator Manual located at:</i> http://www.dot.state.pa.us/public/BUREAUS/design/Scour-Calculator-Manual.pdf . <i>Inspectors must correct or complete this data as needed so that the Scour Calculator can determine an appropriate SCBI code other than 6.</i>
5	Bridge foundations determined to be stable for assessed or calculated scour conditions. Scour is determined to be within limits of footing or piles by assessment (i.e., bridge foundations are on rock formations that have been determined to resist scour within the service life of the bridge), by calculations, or by installation of properly designed measures (see: HEC 23 or DM-4, PP Chapter 7).
4	Bridge foundations determined to be stable for assessed or calculated scour conditions; field review indicates action is required to protect exposed foundations. <i>As determined through field observation and the use of the Scour Calculator; these methods have established the foundations to be stable; however, mitigation efforts such as debris removal, rock protection, or other countermeasures are needed to protect exposed foundations.</i>
3	Bridge is scour critical; foundations determined to be unstable for assessed or calculated scour conditions: <ol style="list-style-type: none"> 1) Scour within limits of footing or piles 2) Scour below bottom of spread footing or pile tips <i>As determined through field observation and the use of the Scour Calculator; these methods have established the structure to be at risk due to potential scour. The threat may be either from advanced scour, undermining, or instability. Note: if the structure warrants a rating of 3, encode a maintenance item for the proper substructure unit on the IM screen with a priority code of "0", "1", or "2" until repairs are made.</i>
2	Bridge is scour critical; field review indicates that extensive scour has occurred at bridge foundations, which are determined unstable by: <ol style="list-style-type: none"> 1) A comparison of calculated scour and observed scour during the bridge inspection, or 2) An engineering evaluation of the observed scour condition reported by the bridge inspector in Item 1A02 (Substructure Condition Rating) <i>As determined through field observation and the use of the Scour Calculator; bridge inspection reveals that <u>serious scour has occurred</u> at the site and has caused distress in substructure components or <u>potentially threatens the structure's stability</u>. Note: if the structure warrants a rating of 2, encode a maintenance item for the proper substructure unit on the IM screen with a priority code of "0" or a "1" until repairs are made, or the bridge is closed. Additionally, if the structure warrants a SCBI rating factor of "2" or less, Item 1A02 – Substructure or 1A03 – Culvert (depending on the structure type) condition rating should also be assigned the same rating value (Ref: FHWA Memo dated April 27, 2001).</i>

(table continued on the following page)

1	<p>Bridge is scour critical; field review indicates that failure of piers/abutments is imminent. Bridge is closed to traffic. Failure is imminent based on:</p> <ol style="list-style-type: none"> 1) A comparison of calculated scour and observed scour during the bridge inspection, or 2) An engineering evaluation of the observed scour condition reported by the bridge inspector in Item 1A02 (Substructure Condition Rating) <p><i>Bridge inspection reveals that the foundation is extensively scoured and at the risk of imminent failure. The risk to public safety warrants closing the bridge. Note: if the structure warrants a rating of 1, encode a maintenance item for the proper substructure unit on the IM screen with a priority code of "0" until repairs are made, or the bridge is closed. Additionally, if the structure warrants an SCBI rating factor of "2" or less, Item 1A02 – Substructure or 1A03 – Culvert (depending on the structure type) condition rating should also be assigned the same rating value (Ref: FHWA Memo dated April 27, 2001).</i></p>
0	<p>Bridge is scour critical. Bridge has failed and is closed to traffic due to scour.</p> <p><i>Bridge inspection reveals that the bridge has failed due to scour. Note: if the structure warrants a rating of 0, encode a maintenance item for the proper substructure unit on the IM screen with a priority code of "0" until repairs are made, or the bridge is closed. Additionally, if the structure warrants an SCBI rating factor of "2" or less, Item 1A02 – Substructure or 1A03 – Culvert (depending on the structure type) condition rating should also be assigned the same rating value (Ref: FHWA Memo dated April 27, 2001).</i></p>

Definitions:

Analyzed – The structure has received a full engineering evaluation which includes calculation of hydrology, hydraulics, scour, and foundation stability. A copy of the evaluation should be stored in BMS2. This is more commonly referred to as an "H&H Report", or as "Computed" in Field IU03.

Assessed – The structure has been properly and accurately assessed for scour (i.e., received a PA Observed Scour Assessment) utilizing the SCBI Scour Calculator in BMS2 or iForms, including the completion of all applicable IU and IN fields. This is also referred to as "Observed" in Field IU03.

Calculate – This is the button clicked to run the scour calculator based on the data entered in the IN fields on the sub-units tab of the Underwater screen in BMS2 or on Form G – Underwater within iForms. The scour calculator should be run during every Routine, Underwater, or any other inspection type where the substructure or channel is evaluated.

Scour Screening – Review of pertinent data on the structure to determine a preliminary scour ranking.

SC (Scour Calculator) – Function used to determine the SCBI for an Observed Scour Assessment.

Notes:

- (1) Calculated scour depths recorded in BMS2 or 100-year/500-year water surface elevations shown on the design or rehabilitation plans are an indicator that an H&H analysis was performed and that the bridge foundations have been designed to resist failure due to scour based on the results of the H&H analysis. This may include properly designed measures. Efforts should be made to locate the analysis and add it to the bridge file (preferably in the Structure Document List Screen).
- (2) Although a bridge may not have originally had its foundations designed based on the results of an H&H analysis, an analysis could have been performed later to install designed measures, or to verify that the existing foundations are below the elevation of the calculated scour depth.
- (3) The USGS EF (Evaluation Final) rating is documented in Item 2A01 – Structure Notes. Revised ratings for 4A08 could also be documented on a hardcopy print-out from the USGS Scour Calculator database and stored in the bridge file (preferably in the Structure Document List Screen).
- (4) SC Inputs include Fields IN04 (Change since Last Inspection), IN05 (Scour Hole), IN12 (OSA Pier/Abutment Foundation Type), IN13 (PA Foundation Type), IN14 (OSA Foundation Type), IN15 (Streambed Material), and IN19 (Movement Indicator).
- (5) When item IU03 = C, the bridge is still required to have an observed scour assessment and the scour calculator should be run. If item IU04 is determined to be a 5 or below, the inspector should review the SC inputs and determine if the IU03 coding should be changed from "C" to "O" to reflect SC input changes from the designed condition determined through an H&H Analysis.

4A08b Scour Critical Category

Inspection > Underwater; Form G

Description:

This item indicates the calculated scour critical category of the bridge.

Procedure:

This item will be **automatically entered by the system** based on the coding shown below. Bridges that meet the criteria below are classified as requiring a scour category. Bridges in Category A, B, or C are Scour Critical. However, all scour categories (A, B, C, and D) require a Scour Plan of Action (POA) and require monitoring during storm events defined by the criteria within the specific POA for that bridge.

When determining if a bridge requires a scour category, each individual sub-unit is evaluated based on the value of Fields IU27 and IN03 for that sub-unit. While the category is stored at a bridge level, it is calculated at the sub-unit level.

Coding:

Category A	Item 4A08 \leq 2 OR Item IN03 \leq 3 OR Item 4A08 = 6
Category B	Item 4A08 = 3 and Item IN03 = 4
Category C	Item 4A08 = 3 and Item IN03 = 5 through 9
Category D	Item 4A08 = 4 or 7

*4A09 Structural Eval – Structural Evaluation

Inspection > Ratings & Schedule

Description:

This item indicates the calculated appraisal of the structural condition of the bridge.

Procedure:

The Structural Evaluation is computed and **automatically entered by the system** for bridges that carry highways, streets, or roads. This item will be coded the value of IW10, Overall Wall Condition, for noise and retaining walls, and coded the value of IS10, Overall Sign Condition, for signs and high mast light poles. This item will be coded "N" for other types of structures (e.g. tunnels and miscellaneous structures).

For non-culvert type structures (5B13 \neq 19), the Appraisal Rating is based on the minimum of the superstructure and substructure condition ratings, and the value from Table 1 (see below) based on the assigned NBI inventory rating, 4B07, and recent ADT, 5C10.

For culvert type structures (5B13 = 19), the Appraisal Rating is based on the minimum of the culvert condition ratings, and the value from Table 1 (see below) based on the assigned NBI inventory rating, 4B07, and recent ADT, 5C10.

The value of 4A09 will be set to 0 if any of the following conditions are met:

- Non-culvert type structures with a superstructure or substructure condition rating equal to 1
- Culvert type structures with a culvert condition rating equal to 1
- Bridges closed to traffic (VP02 = C) due to structural reasons (VP06 = A through L)

The bridge is appraised not only on physical condition, but also on load carrying capacity of the superstructure and substructure. Hence, a well maintained bridge may be appraised at a "4" or "5" because the original design load or the inventory rating was less than today's standard (see Table 1).

Coding:

Refer to APPRAISAL RATING CODES at the beginning of this section and Table 1 on the next page.

TABLE 1
Rating by Comparison of Recent ADT (5C10) and Assigned NBI Inventory Rating (4B07)

Table 1 Notes:

1. Use the lower rating code for values between those listed in the table.
2. All bridges on the interstate system shall be evaluated using the ADT column of > 5000 regardless of the actual ADT on the bridge.
3. Values in {brackets} represent PHL-93 Rating Factors. Values can be obtained by dividing PHL-93 Inventory Rating tons by 36T or directly from analysis.

Structural Evaluation Rating Code	Inventory Rating		
	Average Daily Traffic (ADT)		
	0-500	501-5000	>5000
9	>36{1.00}* (HS20)**	>36{1.00} (HS20)	>36{1.00} (HS20)
8	36{1.00} (HS20)	36{1.00} (HS20)	36{1.00} (HS20)
7	31{0.85} (HS17)	31{0.85} (HS17)	31{0.85} (HS17)
6	23{0.65} (HS13)	25{0.70} (HS14)	27{0.75} (HS15)
5	18{0.50} (HS10)	20{0.55} (HS11)	22{0.60} (HS12)
4	12{0.33} (HS7)	14{0.40} (HS8)	18{0.50} (HS10)
3	Inventory rating less than value in rating code of 4 and requiring corrective action***		
2	Inventory rating less than value in rating code of 4 and requiring replacement***		
0	If the bridge is closed due to structural condition		

* Coded HS rating load (Load Factor) {PHL-93-LRFR}

** HS designation (typical)

*** Structures requiring corrective action should have 3B01/3B02 coded as rehabilitation; Structures requiring replacement should have 3B01/3B02 coded as replacement

***4A10 Deck Geometry - Deck Geometry Appraisal**

Inspection > Ratings & Schedule; Form A > Vertical Clearance; Form G > Vertical Clearance Signing

Description:

This item indicates the calculated appraisal of the bridge deck geometry. Value cannot be changed except through iForms or BMS2 web.

Procedure:

The overall rating for deck geometry includes two evaluations: 5C27, the curb-to-curb or face-to-face of rail bridge width using Table 2A, 2B, 2C or 2D, and 4A15, the minimum vertical clearance over the bridge roadway using Table 2E. The lower of the codes obtained from these tables is used. When a table lists several deck geometry rating codes for the same roadway width under a specific ADT, the lower code is used. The curb-to-curb or face-to-face of rail dimension is taken from 5C27, Bridge Roadway Width, curb-to-curb. Item 4A15, Minimal Vertical Clearance Over Bridge Roadway is used to evaluate vertical clearance.

Example:

Table 2A lists deck geometry rating codes of 6, 7, and 8 for a 44-foot roadway width and an ADT of >5000. Code: Use the

6

lower code for values between those listed in the tables.

Coding:

Refer to Tables 2A, 2B, 2C, 2D, and 2E. Code "N" for non-highway related features. Refer to the Structure Type Coding Item Comparison Chart in Section 1A – Inspection Condition section for use of "N".

Table 2A, 2B, 2C, 2D and 2E Notes:

1. The lower rating code for values between those listed in the table is used.
2. Dimensions are in feet.
3. Table 2C is used for Other Multilane Divided Facilities for 3 or more undivided lanes of 2-way traffic. Note: For 2-way traffic with non-mountable median, the full bridge width cannot be used. Use the bridge width for one direction (the more restrictive) with Table 2C.
4. On Table 2B, a value of 3 or below is coded when the ADT is greater than 100.
5. For urban bridges on curbed streets where it is unlikely that a wider replacement bridge would be built due to existing curbs, sidewalks, or other physical obstructions on the approach, a higher appraisal value may be assigned for deck geometry than indicated in Table 2A. A value of 6 or above is coded for such bridge widths that appear to be adequate for speed, ADT, and traffic safety. The bridge inspection supervisor should review such bridges. Reference the 2004 AASHTO Geometric Design Guide, Chapter IV, for acceptable curbed widths.
6. Table 2C is used for mainline "ramp" connectors between freeways.

TABLE 2A & 2B
Rating by Comparison of ADT (5C10) and Bridge Roadway Width, Curb-To-Curb (5C27)

TABLE 2A							TABLE 2B	
Deck Geometry Rating Code (4A10)	Bridge Roadway Width (feet) 2 Lanes; 2 Way Traffic						Bridge Roadway Width 1 Lane; 2 Way Traffic	
	ADT (Both Directions) **						ADT (Both Directions)	
	0-100	101-400	401-1000	1001-2000	2001-5000	>5000	0-100	>100
9	>32	>36	>40	>44	>44	>44	----	----
8	32	36	40	44	44	44	15'-11"	----
7	28	32	36	40	44	44	15	----
6	24	28	30	34	40	44	14	----
5	20	24	26	28	34	38	13	----
4	18	20	22	24	28	32 (28*)	12	----
3	16	18	20	22	26	30 (26*)	11	15'-11"
2	Any width less than required for a rating code of 3 and structure is open							
0	If this item is the reason for closure							

* Use value in parenthesis for bridges longer than 200 feet.

** For closed bridges use last known ADT.

TABLE 2C & 2D
Rating by Comparison of Number of Lanes (5C08) and Bridge Roadway Width, Curb-To-Curb (5C27)

Deck Geometry Rating Code (4A10)	TABLE 2C				TABLE 2D	
	Bridge Roadway Width (feet) 2 Lanes or More One Direction				Bridge Roadway Width 1 Way Traffic	
	Interstate & Other Divided Freeways		Other Multilane Divided Facilities		Ramps Only	
	2 Lanes	3 or More Lanes	2 Lanes	3 or More Lanes	1 Lane	2 or More Lanes
9	>42	>12N+24	>42	>12N+18	>26	>12N+12
8	42	12N+24	42	12N+18	26	12N+12
7	40	12N+20	38	12N+15	24	12N+10
6	38	12N+16	36	12N+12	22	12N+8
5	36	12N+14N	33	11N+10	20	12N+6
4	34 (29)*	11N+12 (11N+7)*	30	11N+6	18	12N+4
3	33 (28)*	11N+11 (11N+6)*	27	11N+5	16	12N+2
2	Any width less than required for a rating code of 3 and structure is open					
0	If this item is the reason for closure					

* Use value in parenthesis for bridges longer than 200 feet.

TABLE 2E
Rating by Comparison of Minimum Vertical Clearance (4A15) and Functional Classification (5C22)

Deck Geometry Rating Code (4A10)	Minimum Vertical Clearance Over the Bridge (feet)			
	Functional Class			
	Interstate & Other Freeways		Other Principal & Minor Arterials	Major & Minor Collectors & Locals
All Routes - Except as Noted for Urban Areas	Undesignated Routes - Urban Areas*			
9	>17'-0"	>16'-6"	>16'-6"	>16'-6"
8	17'-0"	16'-6"	16'-6"	16'-6"
7	16'-9"	15'-6"	15'-6"	15'-6"
6	16'-6"	14'-6"	14'-6"	14'-6"
5	15'-9"	14'-3"	14'-3"	14'-3"
4	15'-0"	14'-0"	14'-0"	14'-0"
3	Vertical clearance less than value in rating code of 4 and requiring corrective action			
2	Vertical clearance less than value in rating code of 4 and requiring replacement			
0	If this item is the reason for closure			

* Use for routes in highly developed urban areas only when there is an alternative interstate, freeway, or expressway facility with a minimum of 16'-0" clearance

*4A11 Underclearances - Underclearance Appraisal

Inspection > Ratings & Schedule; Form A > Vertical Clearance

Description:

This item indicates the calculated appraisal of the bridge underclearances, vertical and horizontal. Value cannot be changed except through iForms or BMS2 web.

Procedure:

This code indicates the appraisal of the vertical and horizontal underclearances from the through roadway to the superstructure or substructure units, respectively.

Code "N" is used unless the bridge is over a highway or railroad.

The vertical underclearance is evaluated using Table 3A.

The horizontal underclearance is evaluated using Table 3B. The lower of the codes obtained from Table 3A and Table 3B is used.

Bridges seldom are closed due to deficient underclearances, however, these bridges may be good candidates for rehabilitation or replacement.

Coding:

Refer to Tables 3A and 3B below.

**TABLE 3A
Rating by Comparison of Minimum Vertical Underclearance (4A17) and
Functional Classification of Underpassing Route (5C22)**

Under Clearanc e Rating Code (4A11)	Minimum Vertical Clearance (feet)				
	Functional Class				Railroad
	Interstate & Other Freeways		Other Principal & Minor Arterials	Major & Minor Collectors & Locals	
	All Routes - Except as noted for Urban Areas	Undesignated Routes - Urban Areas*			
9	>17'-0"	>16'-6"	>16'-6"	>16'-6"	>23'-0"
8	17'-0"	16'-6"	16'-6"	16'-6"	23'-0"
7	16'-9"	15'-6"	15'-6"	15'-6"	22'-6"
6	16'-6"	14'-6"	14'-6"	14'-6"	22'-0"
5	15'-9"	14'-3"	14'-3"	14'-3"	21'-0"
4	15'-0"	14'-0"	14'-0"	14'-0"	20'-0"
3	Underclearance less than value in rating code of 4 and requiring corrective action				
2	Underclearance less than value in rating code of 4 and requiring replacement				
0	If this item is the reason for closure				

* Use for routes in highly developed urban areas only when there is an alternative interstate, freeway, or expressway facility with a minimum of 16'-0" clearance

Table 3A Notes:

- 1 The lower rating code for values between those listed in the table is used.
- 2 The functional classification of the underpassing route is used in the evaluation. If an "under" record is not coded, the underpassing route is considered a major or minor collector or a local road.
- 3 Ramp bridges must meet the same vertical clearance as main line structures.

TABLE 3B
Rating by Comparison of Minimum Lateral Underclearances Right (4A19) & Left (4A20) and
Functional Classification of Underpassing Route (5C22)

Under Clearance Rating Code (4A11)	Minimum Lateral Underclearance (feet)						
	Functional Class						Railroad
	1 way Traffic			2 way Traffic			
	Principal Arterials - Interstate, Freeways or Expressways				Other Principal & Minor Arterials	Major & Minor Collectors & Locals	
	Main Line		Ramp				
Left	Right	Left	Right				
9	>30	>30	>4	>10	>30	>12	>20
8	30	30	4	10	30	12	20
7	18	21	3	9	21	11	17
6	6	12	2	8	12	10	14
5	5	11	2	6	10	8	11
4	4	10	2	4	6	4	8
3	Underclearance less than value in rating code of 4 and requiring corrective action						
2	Underclearance less than value in rating code of 4 and requiring replacement						
0	If this item is the reason for closure						

Table 3B Notes:

- 1 The lower rating code for values between those listed in the table is used.
- 2 Dimensions are in feet.
- 3 When acceleration or deceleration lanes or ramps are provided under 2 way traffic, the value from the right ramp column is used to determine the code.
- 4 The functional classification of the underpassing route is used in the evaluation. If an "under" record is not coded, the underpassing route is considered a major or minor collector of a local road.

Example:

Bridge over Highway

Code: 3 or less if vertical clearance of the highway under the bridge is < 14'-0"

Bridge over Railroad

Code 3 or less if:

- 1) vertical clearance under the bridge over a railroad is < 20'-0"
- OR
- 2) minimum lateral underclearance < 8'-0"

***4A12 SD/FO - Structurally Deficient/Functionally Obsolete**

Inspection > Ratings & Schedule

Description:

This display only item indicates if the bridge is structurally deficient or functionally obsolete.

Procedure:

Computed and entered automatically by the system for bridges that carry highways, streets or roads. If condition ratings are changed in BMS2, this field will update upon acceptance.

Note:

Any bridge classified as structurally deficient is excluded from the functionally obsolete category.

Coding:

- 0 Not Deficient
- 1 Structurally Deficient
- 2 Functionally Obsolete

- | | |
|---|---|
| <p style="text-align: center;"><u>Structurally Deficient:</u></p> <p>1. Condition Rating of 4 or Less for:</p> <p style="padding-left: 40px;">1A01, Deck or
1A04, Superstructure or
1A02, Substructure or
1A03, Culvert</p> | <p style="text-align: center;"><u>Functionally Obsolete:</u></p> <p>1. Appraisal Rating of 3 or Less for:</p> <p style="padding-left: 40px;">4A10, Deck Geometry or
4A11, Underclearances or
4A02, Approach Roadway Alignment</p> <p style="text-align: center;">OR</p> <p>2. Appraisal Rating of 3 or Less for:</p> <p style="padding-left: 40px;">4A09, Structural Condition or
1A06, Waterway Adequacy</p> |
|---|---|

***4A13 Sufficiency Rating - Federal Sufficiency Rating of the Structure**

Inspection > Ratings & Schedule

Description:

This display only item indicates the Sufficiency Rating of the structure.

Procedure:

Computed and entered automatically by the system overnight based on the sum of S1 + S2 + S3. S4 is subtracted from this sum when the sum is greater than or equal to 50.0. If condition ratings are changed in BMS2, the new Sufficiency Rating will be updated overnight and be displayed the following day.

Coding:

A specific number, to the nearest tenth, computed by the system.

- Range: 0.0 - 100.0
- 100.0 Structure entirely sufficient
- 0.0 Structure entirely insufficient (deficient)

4A14 Bridge Condition - Bridge Condition

Inspection > Ratings & Schedule

Description:

This display only item indicates the Bridge Condition.

Procedure:

Computed and entered automatically based on the lowest of the deck (1A01), superstructure (1A04), substructure (1A02) and culvert (1A03) condition ratings as follows:

Good - lowest rating ≥ 7 Fair - lowest rating = 5 or 6 Poor - lowest rating ≤ 4

Coding:

G	Good condition	P	Poor condition
F	Fair condition	N	Not Applicable

*4A15 Over Structure - Minimum Vertical Clearance Over Bridge Roadway

Inventory > Features

Description:

This item is used to record the actual minimum vertical clearance over the bridge roadway, including shoulders, to any superstructure restriction, to the nearest hundredth of a foot.

Procedure:

This item will be automatically filled in by the system based on information entered in items 6C20 and 6C21.

*4A16 Under (Reference) - Minimum Vertical Underclearance Reference Feature

Inventory > Features

Description:

This item indicates the reference feature from which the minimum vertical underclearance measurement is taken.

Procedure:

This item will be automatically filled in by the system based on information entered in items 6C20 and 6C21.

***4A17 Under Clearance - Minimum Vertical Underclearance**

Inventory > Features

Description:

This item is used to record the actual minimum vertical clearance from the reference feature to the structure, truncated to the nearest hundredth of a foot. It is also used to record the vertical clearance for sign structures.

Procedure:

This item will be automatically filled in by the system based on information entered in items 6C20 and 6C21.

***4A18 Reference Feature - Minimum Lateral Underclearance Reference Feature**

Inventory > Features

Description:

This item indicates the reference feature from which the lateral underclearance measurement is taken.

Procedure:

Select the code which indicates the reference feature from which the minimum lateral underclearance measurement is taken.

Coding:

- H Highway beneath structure
- R Railroad beneath structure
- N Feature not a highway or railroad

***4A19 Right Side - Minimum Lateral Underclearance on the Right Side**

Inventory > Features; Form A - Vertical Clearance

Description:

This item is used to record the minimum lateral clearance on the right edge of the roadway(s) beneath the bridge, measured to the nearest tenth of a foot. This item is applicable for features, either a highway or a railroad beneath a bridge.

Procedure:

Enter the minimum lateral clearance on the right edge of the roadway(s) beneath the bridge, measured to the nearest tenth of a foot. This item is applicable for features, either a highway or a railroad beneath a bridge.

Refer to the Definitions Section for sketches and a definition of the right edge of a roadway.

The lateral clearance should be measured from the right (outside) edge of the through roadway excluding shoulders or ramps, or from the centerline (between the rails) of the outside tracks in the case of a railroad, to the ¹nearest obstruction (pier, substructure unit, abutment, etc.) or to the rigid barrier, or to the toe of slope steeper than 3 to 1. Enter the minimum clearance after measuring in both directions of travel.

For a divided highway, measure the outside clearances of both roadways and enter the smaller distance.

In the case of a one-way street, road or ramp, this refers to the right edge of roadway in the direction of travel.

Coding:

Lateral clearance to the nearest tenth of a foot. Refer to the sketches after item 4A20.

Reference:

FHWA's Recording and Coding Guide for the Structural Inventory and Appraisal of the Nation's Bridges. (FHWA Green Book).

¹Note: Curbs are not obstructions for this item.

Note:

The purpose of this item is to identify available space for future lanes under the bridge.

***4A20 Left Side - Minimum Lateral Underclearance on the Left Side**

Inventory > Features; Form A - Vertical Clearance

Description:

This item is used to record the minimum lateral clearance on the left edge of the roadway(s) beneath the bridge, measured to the nearest tenth of a foot. This item is applicable for features, either a highway or a railroad beneath a bridge.

Procedure:

Enter the minimum lateral clearance on the left edge of the roadway(s) beneath the bridge, measured to the nearest tenth of a foot. This item is applicable for features, either a highway or a railroad beneath a bridge.

Refer to the Definitions Section for sketches and a definition of the left edge of a roadway.

The lateral clearance should be measured from the left (median side for divided highways) edge of the through roadway to the ¹nearest obstruction (pier, substructure unit, abutment, etc.) or any median barrier or to the toe of slope steeper than 3 to 1. For a divided highway, enter the minimum lateral clearance after measuring in both directions of travel.

In the case of a divided highway where there is no obstruction in the median area, enter 999 to denote open. For clearances greater than 99.8 feet, enter 998 (Applicable for Old BMS only. BMS2 allows users to enter clearances greater than 100 feet). If the feature under a bridge is a railroad, enter 000 for not applicable.

In the case of a one-way street, road or ramp, this refers to the left edge of roadway in the direction of travel.

Coding:

Lateral clearance to the nearest tenth of a foot. Refer to the sketches after this item.

- 998 Lateral clearance greater than 99.8 feet (Applicable for Old BMS only. BMS2 allows users to enter clearances greater than 100 feet.)
- 999 No obstruction in the median area (median code 5 or 7)
- 000 Not applicable

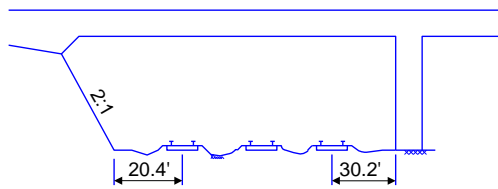
Reference:

FHWA's Recording and Coding Guide for the Structural Inventory and Appraisal of the Nation's Bridges. (FHWA Green Book).

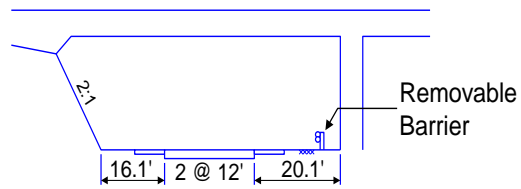
¹Note: Curbs are not obstructions for this item.

Note:

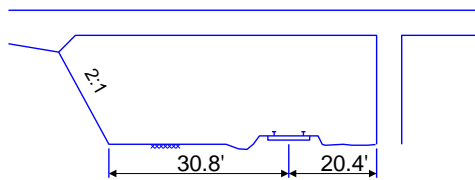
The purpose of this item is to identify available space for future lanes under the bridge.



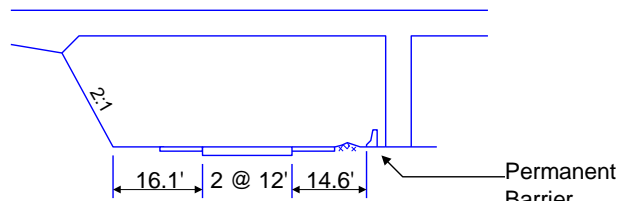
000 Lt. 20.4 Rt.



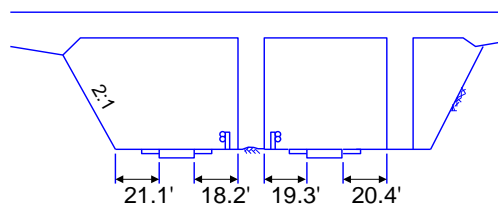
000 Lt. 16.1' Rt. for 2-way Traffic
16.1' Lt. 20.1' Rt. for 1-way Traffic



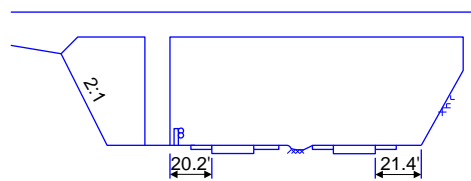
000 Lt. 20.4' Rt.



000 Lt. 14.6' Rt. for 2-way Traffic
16.1' Lt. 14.6' Rt. for 1-way Traffic



18.2' Lt. 20.4' Rt.



999 Lt. 20.2 Rt.

***4A21 Nav Control Exists - Does Navigation Control Exist?**

Inventory > Features > Waterway Detail; Form D

Description:

This item indicates the status of navigation control at the bridge.

Procedure:

Select the appropriate code to indicate the status of navigation control at the bridge. If this field is coded "1 - Navigational Control Exists," Field 4A07 - Pier Protection must also be coded.

Coding:

- 0 Navigation control does not exist.
- 1 Navigation control exists.
- N Not applicable, no water.

***4A22 Nav Vertical Clr - Navigation Vertical Clearance**

Inventory > Features > Waterway Detail; Form D

Description:

This item is used to record the minimum vertical navigation clearance imposed at the site as measured above a datum that is specified on a navigation permit issued by a control agency. The minimum navigation vertical clearance is also recorded for vertical lift bridges.

Procedure:

If navigation control exists (item 4A21 coded "1"), enter the vertical clearance. Vertical clearance is defined as the minimum clearance imposed at the site as measured above a datum that is specified on a navigation permit issued by a control agency. Code as a 3 digit number rounded down to the nearest foot. This measurement will show the clearance that is allowable for navigational purposes.

In the case of a swing or bascule bridge, the vertical clearance is measured with the bridge in the closed position (i.e., open to vehicular traffic). Vertical clearance of a vertical lift bridge is measured with the bridge in the raised or open position. Also, Item 4A24 - Minimum Navigation Vertical Clearance Vertical Lift Bridge shall be coded to provide clearance in a closed position. If Item 4A21 - Navigation Control has been coded 0 or N, code 000 to indicate not applicable.

Coding:

Vertical clearance to the nearest foot. Code zeros if navigation control does not exist.

***4A23 Nav Horizontal Clr - Navigation Horizontal Clearance**

Inventory > Features > Waterway Detail; Form D

Description:

This item is used to record the minimum horizontal navigation clearance imposed at the site that is specified on a navigation permit issued by a control agency.

Procedure:

If navigation control exists (item 4A21 coded "1"), enter the horizontal clearance. This measurement is shown on the navigation permit and may be less than the structure allows. If a navigation permit is required but not available, use the minimum horizontal clearance between fenders, if any, or clear distance between piers and bents. Code 4 digits to the nearest foot. If Item 4A21 - Navigation Control has been coded 0 or N, code 000 to indicate not applicable.

Coding:

Horizontal clearance to the nearest foot. Code zeros if navigation control does not exist.

***4A24 Min Vert Lift Clr - Minimum Navigation Vertical Clearance - Vertical Lift Bridge**

Inventory > Features > Waterway Detail; Form D

Description:

This item is used to record the minimum navigation vertical clearance for vertical lift bridges in the dropped or closed position only.

Procedure:

Enter the minimum navigation vertical clearance for vertical lift bridges in the dropped or closed position only. Record the nearest foot (using 3 digits rounding down) the minimum vertical clearance imposed at the site as measured above a datum specified on a navigation permit issued by a control agency. Code this item only for a vertical lift bridge in the dropped or closed position, otherwise, leave blank. If Item 4A21 - Navigation Control has been coded 0 or N, code 000 to indicate not applicable.

Coding:

Vertical clearance for vertical lift bridges in the dropped or closed position. Leave blank if not vertical lift bridge. Code zeros if navigation control does not exist.

4B Inspection Appraisal - Load Ratings

The Inspection Appraisal - Load Ratings Screen shows information about the load ratings and posting status of the structure. All fields on this screen except for Item 4B01 are automatically filled in based on the information entered on the Inspection - Load Rating (IR) screen. Any fields (except for item 4B01) that require edits must be made on the Inspection - Load Rating (IR) Screen.

*4B01 Design Load 🚧

Inspection > Load Rating

Description:

This item indicates the live load used for design.

Procedure:

Select the code which indicates the live load used for design. Previous code of "0" is no longer valid. Code should be updated after structure is rehabilitated/reconstructed, if applicable.

Coding:

- 1 H10
- 2 H15
- 3 HS15
- 4 H20
- 5 HS20
- 6 HS20 and Alternate Military loading (2 - 24 kip axles at 4 ft c.- c.)
- 7 Pedestrian
- 8 Railroad
- 9 HS25
- A HS25 and 125% of Alternate Military loading plus the standard permit load at operating level.
- B HS25 and 125% of Alternate Military loading
- H HL-93
- P PHL-93
- C Greater than HL93
- D Unknown

Example: The bridge was designed for an HS20 load.

Code: 5

4B02 Rat Dt, Initials - Rating Date and Initials

Inspection > Load Rating

Description:

This two part item is used to record the date the load rating was performed for the structure and the initials of the person who performed the rating.

Procedure:

Do not enter the initials of the Load Rating Engineer. The name of the Load Rating Engineer should be entered in item IR16. The rating date will be automatically filled in by the system based on information entered in item IR03.

*4B03 Posting - Bridge Posting

Inspection > Ratings & Schedule

Description:

This item indicates the appraisal of the load capacity of the bridge.

Procedure:

This item will be automatically filled in by the system based on information entered in items IR06, IR11, and IR21 for the H-20, HS-20, ML-80, and TK-527 vehicles.

This item evaluates the load capacity of a bridge in comparison to the state legal load. In a way, it merely reflects the relationship between the load that may legally use the bridge and the desired capacity for bridges on the same highway system. It differs from the appraisal of the "Structural Condition" which uses inventory or design rating. Load capacity for posting at or below the operating rating may also be based on any stress level between inventory and operating rating using engineering judgment.

The use or presence of a temporary bridge affects the coding. Bridge rating appraisal should reflect either the actual capacity or the posted load, if any, of the temporary bridge. This also applies to bridge shored up or repaired on a temporary basis. This means that the appraisal rating will reflect the loads the bridge is actually carrying.

The degree that operating stress level is under the maximum legal load stress level may be used to differentiate between codes.

Coding: Relationship of Operating Rating Tonnage to Maximum Legal Load

Code	Lowest Ratio*	H-20 Rating In Tons	HS-20 Rating In Tons	ML-80 Rating In Tons	TK-527 Rating In Tons
9	1.31 or more	27 or greater	48 or greater	48 or greater	53 or greater
8	1.21-1.30	25-26	44-47	45-47	49-52
7	1.11-1.20	23-24	40-43	41-44	45-48
6	1.06-1.10	22	38-39	39-40	43-44
5	1.00-1.05	20-21	36-37	36.6-38	40-42
4	0.91-0.99	19	33-35	34-36.5	37-39
3	0.81-0.90	17-18	30-32	30-33	33-36
2	0.71-0.80	15-16	26-29	26-29	29-32
1	0.61-0.70	13-14	22-25	23-25	25-28
0	0.60 or less	12 or less	21 or less	22 or less	24 or less
N	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable

*Ratio =		H20	OR	HS20	OR	ML80	OR	TK527
		<u>RATING</u>		<u>RATING</u>		<u>RATING</u>		<u>RATING</u>
		20.00 T		36.00 T		36.64 T		40.00 T

Note: Unposted bridges where capacity is based upon engineering judgment shall be coded a maximum of 5. As a guide and for coding purposes only, the values above may be used to code this item.

Note: The actual load posting does not affect Item 4B03

***4B04 Operating Type - Operating Rating Type**

Inspection > Load Rating

Description:

This item records the method of analysis used in determining the Operating rating for the NBI Load Rating.

Procedure:

This item will be automatically filled in by the system based on information entered in item IR06.

***4B05 Opr Rating - Operating Rating**

Inspection > Load Rating

Description:

This item is used to record the NBI Operating Rating for the structure. The operating rating is that load which produced the operating rating stresses specified in the current AASHTO Manual for Bridge Evaluation. The operating rating is the maximum permissible weight of the load type being evaluated, to which the structure may be subjected occasionally. In determining the operating rating, the number of lanes to be loaded will be the number of design traffic lanes in accordance with current AASHTO Standard Specifications for Highway Bridges for HS-20 or AASHTO LRFD Bridge Design Specifications for PHL-93.

Procedure:

This item will be automatically filled in by the system based on information entered in item IR11.

***4B06 Inventory Type - Inventory Rating Type**

Inspection > Load Rating

Description:

This item records the method of analysis used in determining the NBI Inventory ratings.

Procedure:

This item will be automatically filled in by the system based on information entered in item IR06.

***4B07 Inv Rating - Inventory Rating**

Inspection > Load Rating

Description:

This item is used to record the NBI Inventory Rating for the structure. The inventory rating is that load which produces the inventory rating stresses specified in the current AASHTO Manual for Bridge Evaluation, generally the same allowable stresses used in the bridge design. The latter means that until a bridge has deteriorated structurally, or is subjected to superimposed dead loads in excess of those used in the design, the inventory rating is at least equal to the design load. Additionally, it can be stated that inventory rating is that load which can safely utilize an existing bridge for an indefinite period. In determining inventory rating, the number of lanes to be loaded is the number of design traffic lanes in accordance with current AASHTO Standard Specifications for Highway Bridges for HS-20 or AASHTO LRFD Bridge Design Specifications for PHL-93.

Procedure:

This item will be automatically filled in by the system based on information entered in item IR10.

4B08 H20 Opr Rat Typ - H20 Operating Rating Type

Inspection > Load Rating

Description:

This item records the method of analysis used in determining the H20 Operating ratings.

Procedure:

This item will be automatically filled in by the system based on information entered in item IR06.

4B09 H20 Opr Rating - H20 Operating Rating

Inspection > Load Rating

Description:

This item is used to record the H20 Operating rating for the structure. Refer to item 4B05 for a description of Operating rating.

Procedure:

This item will be automatically filled in by the system based on information entered in item IR11.

4B10 H20 Inv Rat Typ - H20 Inventory Rating Type

Inspection > Load Rating

Description:

This item records the method of analysis used in determining the H20 inventory ratings.

Procedure:

This item will be automatically filled in by the system based on information entered in item IR06.

4B11 H20 Inv Rating - H20 Inventory Rating

Inspection > Load Rating

Description:

This item is used to record the H20 inventory rating for the structure. Refer to item 4B07 for a description of inventory rating.

Procedure:

This item will be automatically filled in by the system based on information entered in item IR10.

4B12 ML80

Inspection > Load Rating

Description:

This two part item is used to record operating and inventory ratings for the ML80 loading. Refer to items 4B05 and 4B07 for descriptions of operating and inventory ratings, respectively.

Procedure:

This item will be automatically filled in by the system based on information entered in items IR10 and IR11.

4B13 TK527

Inspection > Load Rating

Description:

This two part item is used to record operating and inventory ratings for the TK527 truck. Refer to items 4B05 and 4B07 for descriptions of operating and inventory ratings, respectively.

Procedure:

This item will be automatically filled in by the system based on information entered in items IR10 and IR11.

4B14 (Not Used - Reserved for Future Use)

4B15 (Not Used - Reserved for Future Use)

4B16 (Not Used - Reserved for Future Use)

[the remainder of this page is intentionally left blank]

5A Inspection Inventory - ID/Admin

The Inspection Inventory - ID/Admin Screen provides identification and administrative structure information for the selected structure.

5A01 Structure ID - Structure Identification Number

Inventory > Structure Home;

Description:

Each structure that is entered in BMS2 must have a unique identification. The method used to provide this identification is to assign a 14 digit number for each bridge being inventoried. This number is comprised of 4 parts. They are: COUNTY, STATE ROUTE, SEGMENT and OFFSET. You must use the identical identification when updating information which has been previously stored. If as little as 1 digit does not agree, it will not be possible to match the updating identification with the identification previously stored.

Procedure:

Enter the appropriate values as identified under the following subheadings for COUNTY, STATE ROUTE, SEGMENT and OFFSET.

A newly built state structure will have the county, state route, segment and offset information on the bridge plans. This will be the structure identification number. All other bridges will be coded as per the instructions, which follow for each sub-item.

County Code:

Enter the county code for the county in which the bridge is located. When a bridge is located across a county boundary, enter the code for the county which has maintenance and inspection responsibility. Prefix with zero when necessary.

County	District	County	District	County	District	County	District
01 Adams	08	18 Clinton	02	35 Lackawanna	04	52 Potter	02
02 Allegheny	11	19 Columbia	03	36 Lancaster	08	53 Schuylkill	05
03 Armstrong	10	20 Crawford	01	37 Lawrence	11	54 Snyder	03
04 Beaver	11	21 Cumberland	08	38 Lebanon	08	55 Somerset	09
05 Bedford	09	22 Dauphin	08	39 Lehigh	05	56 Sullivan	03
06 Berks	05	23 Delaware	06	40 Luzerne	04	57 Susquehanna	04
07 Blair	09	24 Elk	02	41 Lycoming	03	58 Tioga	03
08 Bradford	03	25 Erie	01	42 McKean	02	59 Union	03
09 Bucks	06	26 Fayette	12	43 Mercer	01	60 Venango	01
10 Butler	10	27 Forest	01	44 Mifflin	02	61 Warren	01
11 Cambria	09	28 Franklin	08	45 Monroe	05	62 Washington	12
12 Cameron	02	29 Fulton	09	46 Montgomery	06	63 Wayne	04
13 Carbon	05	30 Greene	12	47 Montour	03	64 Westmoreland	12
14 Centre	02	31 Huntingdon	09	48 Northampton	05	65 Wyoming	04
15 Chester	06	32 Indiana	10	49 Northumberland	03	66 York	08
16 Clarion	10	33 Jefferson	10	50 Perry	08	67 Philadelphia	06
17 Clearfield	02	34 Juniata	02	51 Pike	04		

State Route:

1. Inventory prepared by the Department

(i.e., Department is the Agency submitting, items 6A06, or other Agency that is using the Department’s Location Referencing System):

Enter the state route number shown on the straight line diagram of the route identifying the bridge. The route to be entered is the state route number of the highway on the structure. Where the structure does not carry a state route (such as a railroad, local road, etc.), enter the state route number of the highway under the structure. Sufficient zeros should be prefixed to the route number to complete the 4 digit field.

Example:

State Route 362:

Note: Enter Structure ID without spaces

2. Inventory prepared by the Pennsylvania Turnpike Commission:

Enter one of the following codes:

- | | |
|--|---|
| 7076-I76, East-West Turnpike | 7476-I476, Northeast Extension |
| 7276-I276, East-West Turnpike (Philadelphia) | 7495-I95, East-West Turnpike (Philadelphia) |
| 7376-I376, Beaver Valley Expressway | 7043-PA43, Mon-Fayette Expressway |
| 7066-PA66, Greensburg Expressway | 7576-PA576, Southern Beltway |

Example:

PA Turnpike, Route 576:

Note: Enter Structure ID without spaces

3. Inventory prepared by the Delaware Joint Toll Bridge Commission:

Enter one of the following codes:

- | | |
|------------------------------------|-------------------------------|
| 7991 Bridges in Bucks County | 7993 Bridges in Monroe County |
| 7992 Bridges in Northampton County | 7994 Bridges in Pike County |

Example:

Bridge in Pike County, Delaware:

Note: Enter Structure ID without spaces

4. Inventory prepared by Local Governments or Others:

Enter “7” plus the 3 digit county/borough code (item 5A06).

Example:

County of Dauphin, Berrysburg Borough Bridge:

Note: Enter Structure ID without spaces

5. Inventory prepared by Railroad:

Enter “7” plus the USRA number. The 4th through 7th digits indicate the 4 digit United States Railway Association Number.

Example:

Railway Number 1228:

Note: Enter Structure ID without spaces

Segment of Route:

1. Inventory prepared by the Department:

Enter the segment number of the State Route identified in the item "State Route".

2. Inventory prepared by Others

(Pa. Turnpike Commission, Delaware Joint Toll Bridge Commission, Local Governments, and other agencies):

Enter "99" in the first 2 digits for the Pa. Turnpike Commission. "99" will identify the road systems under PTC jurisdiction. Use the 3rd and 4th digits plus the 4 digits provided for offset of the bridge to record the location of the bridge.

For railroad owned and inventorial structures, use the 2nd, 3rd and 4th digits plus the 4 digits provide for offset of the bridge to record the location of the bridge.

a. Location by Milepoint:

Enter the milepoint as indicated (PTC only):

Milepoint

1.43

Note: Enter number without spaces

126.89

Note: Enter number without spaces

b. Location by Local Bridge Number or Other Identification:

Enter the Local Bridge Number as indicated:

Bridge No.

19

Note: Enter number without spaces

BR25

Note: Enter number without spaces

Offset:

The distance in feet from the beginning of the segment to the beginning of the bridge.

Offset

35

Note: Enter number without spaces

For inventories prepared by agencies other than the Department, refer to the instructions for the segment portion of the Structure identification for the use and interpretations of this sub-item.

***5A02 Name - Structure Name**

Inventory > Structure Home

Description:

This item is used to record the name of the structure in narrative form.

Procedure:

The name of the bridge, if any, should be recorded. In lieu of the bridge name, record the bridge location. The bridge location should be keyed to a distinguishable feature (road junctions, topographical features, etc.) of an Official Department of Transportation map. In the event the bridge has no name and there are no nearby distinguishable features shown on the map, the location may be keyed to other local well known features.

Coding:

Name of bridge or narrative description of the feature intersected.

Examples:

SOUTH BRIDGE
GEORGE WADE BRIDGE
0.5 MI SO OF ROCKPORT

***5A03 NBI Structure No - NBI Structure Number**

Inventory > Structure Home

Description:

This display only item indicates the reference number for the structure within BMS. This item is also known as the Bridge Key (BRKEY).

Procedure:

This item is generated by the system and need not be coded by the bridge inspector.

***5A04 District - District Number**

Inventory > Structure Home

Description:

This item is used to record the district in which the bridge is located.

Procedure:

Select the district in which the bridge is located from the dropdown list.

Coding:

- | | |
|------------|-------------|
| District 1 | District 8 |
| District 2 | District 9 |
| District 3 | District 10 |
| District 4 | District 11 |
| District 5 | District 12 |
| District 6 | |

***5A05 County - County Code**

Inventory > Structure Home

Description:

This item is used to record the county code for the county in which the bridge is located.

Procedure:

Select the county in which the bridge is located from the dropdown list. When a bridge is located across a county boundary, enter the code for the county which has maintenance and inspection responsibility.

Coding:

County	District	County	District	County	District	County	District
01 Adams	08	18 Clinton	02	35 Lackawanna	04	51 Pike	04
02 Allegheny	11	19 Columbia	03	36 Lancaster	08	52 Potter	02
03 Armstrong	10	20 Crawford	01	37 Lawrence	11	53 Schuylkill	05
04 Beaver	11	21 Cumberland	08	38 Lebanon	08	54 Snyder	03
05 Bedford	09	22 Dauphin	08	39 Lehigh	05	55 Somerset	09
06 Berks	05	23 Delaware	06	40 Luzerne	04	56 Sullivan	03
07 Blair	09	24 Elk	02	41 Lycoming	03	57 Susquehanna	04
08 Bradford	03	25 Erie	01	42 McKean	02	58 Tioga	03
09 Bucks	06	26 Fayette	12	43 Mercer	01	59 Union	03
10 Butler	10	27 Forest	01	44 Mifflin	02	60 Venango	01
11 Cambria	09	28 Franklin	08	45 Monroe	05	61 Warren	01
12 Cameron	02	29 Fulton	09	46 Montgomery	06	62 Washington	12
13 Carbon	05	30 Greene	12	47 Montour	03	63 Wayne	04
14 Centre	02	31 Huntingdon	09	48 Northampton	05	64 Westmoreland	12
15 Chester	06	32 Indiana	10	49 Northumberland	03	65 Wyoming	04
16 Clarion	10	33 Jefferson	10	50 Perry	08	66 York	08
17 Clearfield	02	34 Juniata	02	67 Philadelphia	06		

***5A06 City/Town/Place - City/Town/Placecode**

Inventory > Structure Home; Form A > Structure Description

Description:

This item identifies the subdivision of the county (i.e., City, Borough, First Class Township or Second Class Township) in which the bridge is located.

Procedure:

Each city, borough and township is assigned a 3 digit code number. Determine the code number for the subdivision of the county from the list in Appendix B. When a bridge is located across a municipal boundary, enter the code for the municipality which has maintenance and inspection responsibility.

Coding:

A 3 digit code from the codes listed in Appendix B.

Examples:

Cumberland County, East Pennsboro Township	101
Lycoming County, Anthony Township	201
Dauphin County, City of Harrisburg	301
Snyder County, Beavertown Borough	401

***5A07 Features Intersected**

Inventory > Structure Home; Form A > Structure Description

Description:

This item is used to record the features intersected by the structure whether the features are over or under the structure. (Information required to complete this item may be obtained from Data Item 5C01.)

Procedure:

The information to be recorded for this item will be the name or names of the features intersected by the structure whether the features are over or under the structure.

When one of the features intersected is a highway, the signed number or name of the highway (e.g. 181, US 51, SR 772, Mill Road) should appear first (left most) in the field. The name of any other feature should follow, separated by a semi-colon or a comma.

If the structure is over a stream, the name of that stream should be entered here as well as item 5C01.

Abbreviations should be used where necessary, but an effort should be made to keep them meaningful.

Coding:

A narrative description of the features intersected.

***5A08 Facility Carried - Facility Carried by Structure**

Inventory > Structure Home; Form A > Structure Description

Description:

This item is used to record the facility carried by the structure. (Information required to complete this item may be obtained from Data Item 5C01.)

Procedure:

The facility being carried by this structure should be recorded and coded. For example, S to W Ramp, Ramp from I495 to I95, C&O Railroad, Great Eastern Pipeline and others.

Coding:

A narrative description of the facility being carried by the structure.

***5A09 Location - Location of Structure** 📍

Inventory > Structure Home; Form A > Structure Description

Description:

This item is used to record the bridge location in a narrative form. The description is limited to 25 characters. This item must have a description

Procedure:

The bridge location should be keyed to a distinguishable feature (road junctions, topographical features, etc.) of an Official Department of Transportation map. In the event there are no nearby distinguishable features shown on the map, the location may be keyed to other local well known features.

Coding:

A narrative description of the bridge location.

Example:

A bridge is located one half mile south of Rockport:

.5 MI SO OF ROCKPORT

*5A10 Latitude - Latitude of Bridge Location

Inventory > Structure Home


Description:

This item is used to record the latitude of the bridge location.

Procedure:

This item should be entered manually. The latitude should be measured and entered to the nearest hundredth of a second. The location can be entered in degrees minutes seconds or in decimal degrees. **Latitude should be measured at the center of the bridge in the field or with mapping software.** Users can switch between degrees minutes seconds and decimal degrees by clicking the toggle switch to the right of Field 5A11 in BMS2.

This item is required for all bridges on the STRAHNET Highway System. It is recommended this item be coded for all bridges.

If a  appears, the straight line distance between the GPS location combining 5A10 and 5A11 and the GPS location identified by PennDOT One Map is greater than 100'. If the user believes the data in Item 5A10 and 5A11 are correct and One Map is wrong, the user should contact the Bridge Inspection Section and provide a suggested correction.

Coding:

The latitude, in degrees, minutes, and seconds to the nearest hundredth of a second in one of the following format or decimal degrees:

___ ___ Deg ___ ___ *Min ___ ___ . ___ ___ *Sec

___ ___ . ___ ___ ___ ___ Deg

*Enter leading zeros for single digit minutes and seconds for the required number of digits

Example:

A bridge's location is 42 degrees, 7 minutes, and 21.00 seconds latitude

42d 07' 21.00"

A bridge's location is 42 degrees, 7 minutes, and 21.00 seconds latitude

42.122500

*5A11 Long - Longitude of Bridge Location

Inventory > Structure Home


Description:

This item is used to record the longitude of the bridge location.

Procedure:

This item should be entered manually. The longitude should be measured and entered to the nearest hundredth of a second. The location can be entered in degrees minutes seconds or in decimal degrees. **The longitude should be measured at the center of the bridge in the field or with mapping software.** Users can switch between degrees minutes seconds and decimal degrees by clicking the toggle switch to the right of Field 5A11 in BMS2.

This item is required for all bridges on the STRAHNET Highway System. It is recommended this item be coded for all bridges.

If a  appears, the straight line distance between the GPS location combining 5A10 and 5A11 and the GPS location identified by PennDOT One Map is greater than 100'. If the user believes the data in Item 5A10 and 5A11 are correct and One Map is wrong, the user should contact the Bridge Inspection Section and provide a suggested correction.

Coding:

The longitude, in degrees, minutes, and seconds to the nearest hundredth of a second in the following format or decimal degrees.

___ ___ Deg ___ ___ *Min ___ ___ . ___ ___ *Sec

___ ___ . ___ ___ ___ ___ Deg

*Enter leading zeros for single digit minutes and seconds for the required number of digits

Example:

A bridge's location is 76 degrees, 5 minutes, and 06.00 seconds longitude:

76d 05' 06.00"

A bridge's location is 76 degrees, 5 minutes, and 06.00 seconds longitude:

-76.085000

***5A12 Bord St/FHWA Reg - Name of Border State / FHWA Region / Share Percentage**

Inventory > Structure Home

Description:

This three part item that identifies the name of the border state, the FHWA region for bridges that cross state borders, and the responsibility for improvements to the existing bridge when it is shared with a border state. Percent responsibility is expressed in terms of existing bridge deck area.

Procedure:

Select the appropriate code from the dropdown list for the name of the border state in Field 1. Select the appropriate code from the dropdown list for FHWA region in Field 2. In Field 3, enter the percentage of total deck area of the existing bridge that the border state is responsible for funding. If the bridge is not on a state border, leave blank.

Coding:

Fields 1 and 2:

<u>State</u>	<u>Field 1 - State Code</u>	<u>Field 2 - FHWA Region</u>
Delaware	10	3
Maryland	24	3
New Jersey	34	2
New York	36	2
Ohio	39	5
West Virginia	54	3
Bridge not on a state border	N/A	N/A

Field 3:

Percentage of total deck area of the existing bridge that the border state is responsible for funding.

Example:

Border State is responsible for funding 45% of future improvement costs:

45

***5A13 Border Struct No - Border Bridge Structure Number**

Inventory > Structure Home

Description:

This item is used to record the structure number of the border bridge identified in Item 5A12.

Procedure:

Code the border state's NBI structure number for any structure noted in 5A12. This number must match exactly the border state's submitted NBI structure number. The entire 15 digit number must be accounted for including 0's and blanks whether leading, trailing or embedded in the field. If 5A12 is blank, 5A13 must also be blank.

***5A14 FIPS State / Region**

Inventory > Structure Home

Description:

This two part item is used to record the Federal Information Processing Standards (FIPS) code for State and Region.

Procedure:

Select the FIPS state code in Field 1 and the FIPS region code in Field 2.

Coding:

<u>Field 1</u>	<u>Field 2</u>
42 (Pennsylvania)	Region 3

***5A15 Year Built - Year the Bridge Was Built**

Inventory > Structure Home

Description:

This item is used to record the year the bridge was built.

Procedure:

Enter the 4 digit year in which the bridge was originally built. If the year is unknown, provide a best estimate. Code "0000" for years 1900 and earlier if year built cannot be determined.

Coding:

The 4 digit year the bridge was originally built.

Example:

A bridge was built in 1997:

***5A16 Year Reconstruct - Year of Last Major Reconstruction on the Bridge**

Inventory > Structure Home

Description:

This item is used to record the last year that a major reconstruction was performed on the bridge.

Procedure:

Enter the last year in which major reconstruction was performed on the bridge. Use judgment in determining if any of the completed maintenance can be considered as major work. Work should be considered as a major reconstruction only if it results in a long term improvement (minimum 10 year life) and removes structural deficiencies. If the last year of a major reconstruction is unknown, provide a best estimate. If there has been no major reconstruction on the bridge, code zeros for not applicable.

For a bridge to be defined as reconstructed, the type of work performed, whether or not it meets current minimum standards, must have been eligible for funding under any of the Federal-aid funding categories.

The eligibility criteria would apply to the work performed regardless of whether all state or local funds or Federal-aid funds were used. Some types of eligible work not to be considered as reconstruction are listed:

- Safety feature replacement or upgrading (for example, bridge rail approach guiderail or impact attenuators).
- Painting of structural steel.
- Overlay of bridge deck as part of a larger highway surfacing project (for example, overlay carried across bridge deck for surface uniformity without additional bridge work).
- Utility work.
- Emergency repair to restore structural integrity to the previous status following an accident.
- Retrofitting to correct a deficiency which does not substantially alter physical geometry or increase load carrying capacity.
- Work performed to keep a bridge operational while plans for complete rehabilitation or replacement are under preparation (for example, adding a structure element or extra girder).

Coding:

4 digit year in which major reconstruction was performed on the bridge.

***5A17 Type of Service On - Type of Service On Bridge**

Inventory > Structure Home

Description:

This item indicates the type of service on the bridge.

Procedure:

Select the type of service carried by the bridge from the dropdown list.

For specific sign and retaining wall structures, select "S" or "R". By entering this coding, the system will accept entries on the Sign Structure (VS) or Retaining Wall (VW) Screen. Sign Structures mounted to bridges will have their own structure ID's. These should be coded as "S".

Coding:

Type of service carried by the bridge.

- 1 Highway
- 2 Railroad
- 3 Pedestrian exclusively
- 4 Highway - Railroad
- 5* Highway - Pedestrian
- 6 Overpass structure at an interchange level of a multilevel interchange
- 7 Third Level (interchange)
- 8 Fourth Level (interchange)

- 9 Building or Plaza
- 0 Private Road or Other
- H High Mast Light
- M Misc. Structure
- N Noise Wall
- R Retaining Wall
- S Sign Structure
- T Tunnel
- X Demolished/Replaced

Note:

Refer to Publication 238 Section 1.5.3 for the definition of “Highway (Public Roads)”. A private road is a roadway not under public authority jurisdiction, not maintained by public authority, and/or not open to the public. Gated roads which are never open to public traffic should be coded as “Private Road or Other”. Gated roads which are open to seasonal or occasional public traffic should be coded as “Highway”.

*Use for intentional sidewalk applications only. This includes bridges with sidewalks or with shoulders striped for pedestrian use.

Examples:

Highway on structure:

Tunnel:

Sign Structure:

Retaining Wall:

Retaining wall serving as an abutment for a bridge carrying a highway:

***5A18 Under - Type of Service Under Bridge**

Inventory > Structure Home

Description:

This item indicates the type of service under the bridge.

Procedure:

Select the type of service under the bridge from the dropdown list.

Coding:

Type of service passing under the bridge.

- | | |
|--------------------------------|---------------------------------|
| 1 Highway w/ or w/o pedestrian | 6 Highway – Waterway |
| 2 Railroad | 7 Railroad – Waterway |
| 3 Pedestrian exclusively | 8 Highway – Waterway – Railroad |
| 4 Highway – Railroad | 9 Relief (waterway) |
| 5 Waterway | 0 Private Road or Other |

Note:

Refer to Publication 238 Section 1.5.3 for the definition of “Highway (Public Roads)”. A private road is a roadway not under public authority jurisdiction, not maintained by public authority, and/or not open to the public. Gated roads which are never open to public traffic should be coded as “Private Road or

Other". Gated roads which are open to seasonal or occasional public traffic should be coded as "Highway".

Examples:

Bridge over river:

Tunnel:

Retaining wall structure parallel with highway:

***5A19 # Lanes Under - Lanes Under the Structure**

Inventory > Structure Home

Description:

This item is used to record the number of through traffic lanes under the structure. Information required to complete this item may be obtained from item 5C08 and/or FR07.

Procedure:

This item will be automatically filled in by the system based on the information entered in item 5C08 for features under the structure. This item includes all lanes carrying highway traffic (cars, trucks, buses) which are striped or otherwise operated as a full width traffic lane under the structure by the owning and/or maintaining authority. This includes any full width merge lanes and ramp lanes, and is independent of directionality of usage.

When the inventory route is "under" the bridge, code the number of lanes for the inventory route only. When the inventory route is "under" the bridge, the obstruction over the inventory route may be other than a highway bridge (railroad, pedestrian, pipeline, etc.).

Code double deck bridges as 1 or 2 structures as noted in the examples under item 5C08. Either method is acceptable however, all related data must be compatible with the method selected.

Coding:

Number of lanes under the structure.

***5A20 Maint Resp - Maintenance Responsibility for Bridge**

Inventory > Structure Home

Description:

This item indicates which agency has primary responsibility to maintain the bridge.

Procedure:

This item will be automatically filled in by the system based on information entered in item VM03 and VM04. This item should not be changed, but the displayed value should be confirmed.

*5A21 Owner - Owner or Principal Custodian of the Bridge

Inventory > Structure Home

Description:

This item is used to record the owner or principal custodian of the bridge.

Procedure:

Select the name of the owner or principal custodian of the bridge from the dropdown list. In the absence of a clear designation of ownership, enter the name of principal custodian, the agency responsible for maintaining the structure. (Agency maintaining only the roadway surface, curbs, sidewalks, and/or railings of similar minor items should not be considered as principal agency). If more than one agency has equal maintenance responsibility, code one agency in the hierarchy of State, Federal, county, city, railroad, and other private.

Coding:

01	State Highway Agency	32	Local Toll Authority
02	County Highway Agency	60	Other Federal Agencies (not listed below)
03	Town or Township Highway Agency	62	Bureau of Indian Affairs
04	City, Municipal Highway Agency or Borough	64	U.S. Forest Service
11	State Park, Forest or Reservation Agency	66	National Park Service
12	Local Park, Forest or Reservation Agency	68	Bureau of Land Management
21	Other State Agencies	69	Bureau of Reclamation
25	Other Local Agencies	70	Military Reservation Corps of Engineers
26	Private (Other than Railroad)	80	Unknown
27	Railroad	XX	Demolished/Replaced
31	State Toll Authority		

5A22 (Not Used - Reserved for Future Use)

5A23 Agency Admin Area - Agency Administration Area

Inventory > Structure Home

Description:

This item indicates the administrative area within which the structure is located.

Procedure:

Select the planning organization where the structure is located.

Coding:

01-Adams RPO	7-Harrisburg MPO	13-North Central RPO	19-Shenango Valley MPO
02-Altoona MPO	8-Johnstown MPO	14-Northwest RPO	20-Southern Alleghenies RPO
03-Centre MPO	9-Lancaster MPO	15-Northern Tier RPO	21-SPC MPO
04-DVRPC MPO	10-Lebanon MPO	16-Reading MPO	22-Williamsport MPO
05-Erie MPO	11-Lehigh Valley MPO	17-Scranton - Wilkes-Barre MPO	23-York MPO
06-Franklin MPO	12-NEPA RPO	18-SEDA COG RPO	24-Wayne MPO

5A24 Reporting Group

Inventory > Management

Description:

This item is used with the validation logic to allow for more flexibility on which validations should be run on each reporting group. These groups have been setup to align with other reports used by the Department. For example, State Internet Report A consists of groups S1 and S2. Local Internet Report B contains group L1. The annual NBI submission to FHWA consists of groups S1, L1 and A1.

Procedure:

This item will be automatically filled in by the system based on information entered into items 5A17 (Type of Service On), 5A18 (Type of Service Under), 6A06 (Submitting Agency), 5A21 (Owner), 5B18 (Structure Length) and 5E01 (NBIS Bridge Length Indicator).

The S, L and A series contain bridges carrying a highway (i.e. 5A17 = 1, 4, 5, 6, 7 or 8). "State" bridges are defined as state owned with a D## submitting agency, railroad owned carrying a non-7000 series highway with a D## submitting agency, or those carrying a non-7000 series highway with a P## submitting agency.

"Local" bridges are defined as local owned (i.e. 5A21 = 02, 03, 04, 25), railroad owned carrying a 7000 series highway with a ### submitting agency, or those carrying a 7000 series highway with a P## submitting agency.

"AMD" (i.e. Asset Management Division Oversight) bridges are defined as those having 5A21 owner codes of 11, 12, 21, 26, 31, 32, or 80, state owned not having a D## submitting agency, railroad owned carrying a non-7000 series highway not having a D## or P## submitting agency, or railroad owned carrying a 7000 series highway not having a ### submitting agency.

"Federal" bridges are defined as those having a 5A21 owner code of 60, 62, 64, 66, 68, 69 or 70. Some federal bridges are inventoried in the BMS2 system, but they are not included in the annual NBI submission to FHWA. FHWA manages the federal bridges separately and adds them to the NBI submission made by PennDOT.

The O series contains bridges that carry private roads, pedestrians/bicyclists or railroads but do not carry a highway (i.e. 5A17 = 0, 2 or 3). The M1 group consists of miscellaneous structure types (5A17 = 9, H, M, N, R or S). The T1 group consists of tunnels (5A17 = T). The X1 group consists of demolished structures (5A17 = X). The N1 group contains any structures that do not fit the criteria for the rest of the groups likely as a result of miscoded or missing data.

Coding:

S1 State with NBIS = Y	A3 AMD < 8ft
S2 State >= 8ft and NBIS = N	F1 Federal
S3 State < 8ft	O1 Other Bridges >= 8ft and over Highway
L1 Local with NBIS = Y	O2 Other Bridges < 8ft or not over Highway
L2 Local >= 8ft and NBIS = N	M1 Miscellaneous Structures
L3 Local < 8ft	T1 Tunnels
A1 AMD with NBIS = Y	X1 Demolished
A2 AMD >= 8ft and NBIS = N	N1 No Group

5B Inspection Inventory - Design

The Inspection Inventory - Design Screen shows design-related information about the selected structure.

*5B01 Deck Structure Type - Bridge Deck Structure Type

Inventory > Structure Home

Description:

This item indicates the type of structural deck that is supported by the underlying load carrying members of the superstructure.

Procedure:

This item will be automatically filled in by the system based on a conversion from item 6A38 as shown below in the coding table. This item cannot be changed, but the displayed value should be confirmed. Note: NCABB = Non-Composite Adjacent Box Beams.

Coding:

<u>5B01 FHWA Coding</u>	<u>6A38 PennDOT Coding</u>
1 Concrete Cast-in-Place	10, 11, 12, 13, 14, 15, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 32
2 Concrete Precast Panels	08, 09
3 Open Grating	06,
4 Closed Grating	07, 16, 17, 20
5 Steel Plate (including orthotropic)	05
6 Corrugated Steel	None
7 Aluminum	None
8 Wood or Timber	02, 03, 04
9 Other	00(NCABB Only),31, 99
N Not applicable	00(Non-NCABB), 01, 18, 19

*5B02 Deck Surface Type - Deck Surface Type (Main Span)

Inventory > Structure Home; Form B > Wearing Surface

Description:

This item is used to record the type of wearing surface for the main span on the bridge.

Procedure:

Select the type of wearing surface for the main span from the dropdown list.

Coding:

1 Concrete	8 Gravel
2 Concrete Overlay*	9 Other
3 Latex Concrete	0 None (e.g., steel grid)
4 Low Slump Concrete	P PPC Overlay
5 Epoxy Overlay	N Not applicable
6 Bituminous	(applies only to structures with no deck)
7 Wood or Timber	

*Separate layer of concrete added but not latex modified, low slump, etc...

*5B03 Deck Membrane Type

Inventory > Structure Home; Form B > Wearing Surface

Description:

This item is used to record the type of membrane waterproofing on the bridge.

Procedure:

Select the type of membrane from the dropdown list.

Coding:

- | | |
|--------------------|---|
| 1 Built-up | 9 Other |
| 2 Preformed Fabric | 0 None |
| 3 Epoxy | N Not applicable |
| 8 Unknown | (applies only to structures with no deck) |

*5B04 Deck Protection - Deck Protection Type

Inventory > Structure Home; Form B > Wearing Surface

Description:

This item is used to record the type of deck corrosion protection on the bridge.

Procedure:

Select the code from the dropdown list for type of deck protection.

Coding:

- | | |
|---|---|
| 1 Epoxy coated reinforcing | 7 Internally sealed |
| 2 Galvanized reinforcing | 8 Unknown |
| 3 Other coating reinforcing | 9 Other |
| 4 Cathodic protection | 0 None |
| 5 Dense bituminous Overlay
(e.g., Rosphalt 50) | N Not applicable |
| 6 Polymer impregnated | S Low corrosion steel (6A42 = 5, 6, or 7) |

***5B05 Left - Curb / Sidewalk Width on Left**

Inventory > Structure Home

Description:

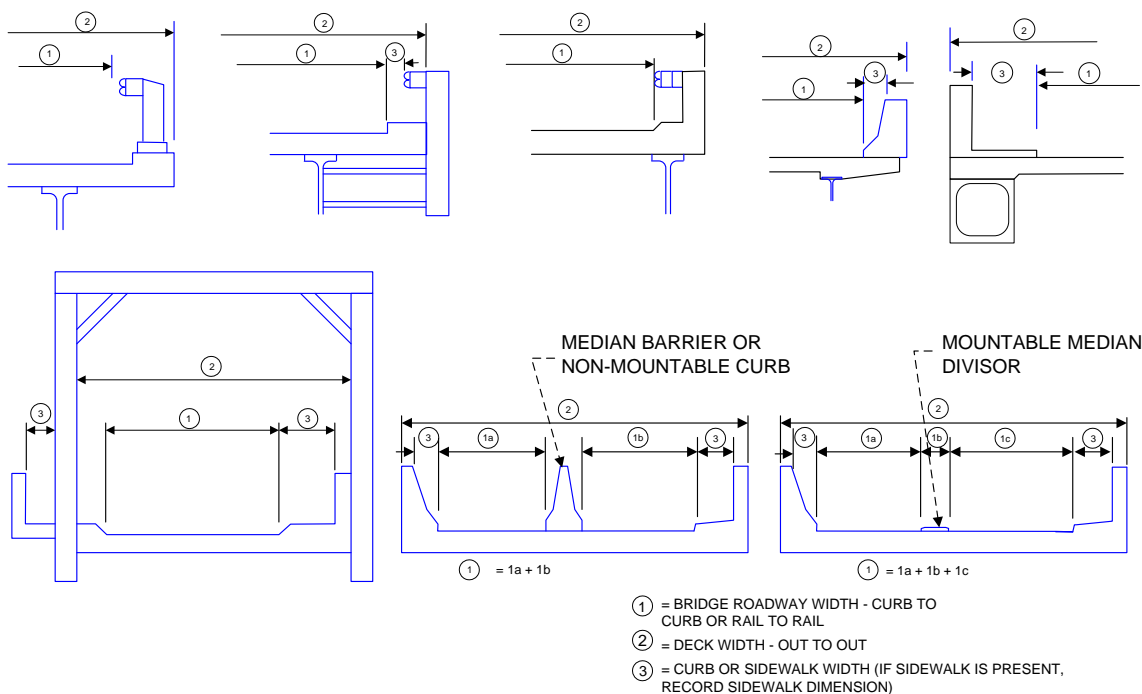
This item is used to record the width of the curb or sidewalk (includes curb width) on the left side.

Procedure:

Enter the clear walkway width of the curb or sidewalk to the nearest tenth of a foot. The width of a curb or sidewalk is measured from the face of the railing to the face of the curb. Enter the smallest width of curb or sidewalk on the bridge. See the sketches below.

Coding:

Width of sidewalk or curb to the nearest tenth foot.



***5B06 Right - Curb / Sidewalk Width on Right**

Inventory > Structure Home

Description:

This item is used to record the width of the curb or sidewalk (includes curb widths) on the right side.

Procedure:

Enter the clear walkway width of the curb or sidewalk to the nearest tenth of a foot. The width of a curb or sidewalk is measured from the face of the railing to the face of the curb. Enter the smallest width of curb or sidewalk on the bridge. See the sketches for item 5B05.

Coding:

Width of sidewalk or curb to the nearest tenth foot. (See example sketches under Item 5B05)

***5B07 Deck Width - Out-to-Out Width of the Bridge Deck** 📄

Inventory > Structure Home

Description:

This item is used to record the out-to-out width of a bridge deck.

Procedure:

Enter the out-to-out width of the bridge deck. The measurement should be exclusive of flared areas for ramps, i.e., it should be the minimum or nominal width. For thru type (truss or girder) bridges, enter the width which represents the lateral clearance between superstructure members. Where traffic runs directly on the top slab (or wearing surface) of a culvert, e.g., an R/C box without fill, enter actual width (out-to-out). This also applies where fill is minimal and culvert headwalls affect the flow of traffic.

This item does not apply where the roadway is on a fill across a culvert where the culvert headwalls do not affect the flow of traffic. In this case, code "0.000" for not applicable.

For a highway tunnel (last 2 digits of item 6A29, Department Structure Type, is 29), enter the width between the wall of the tunnel.

See the sketches following item 5B05.

Coding:

The out-to-out width, to the nearest tenth of a foot.

***5B08 Bridge Median - Median Type**

Inventory > Structure Home

Description:

This item is used to code the type of median on a structure or the type of median separating the roadways (in opposite direction of travel) under the structure.

Procedure:

This item will be automatically filled in by the system based on the median type entered in item 6C25.

Coding:**5B08 FHWA Coding**

- 0 No Median
- 1 Open Median
- 2 Closed Median (no barrier)
- 3 Closed Median with non-mountable barriers

6C25 PennDOT Coding

- 0, N
- 6
- 5, 7
- 1, 2, 3, 4, 8, 9

*5B09 Skew - Skew Angle

Inventory > Structure Home; Form A > Vertical Clearance

Description:

This item is used to record the skew angle of the FEATURE INTERSECTED.

Procedure:

Enter the skew angle for the feature intersected to the nearest degree. Normally the skew angle will be taken from the design drawings. If no design drawings are available, the angle is to be field measured, if possible, or estimated.

For the route carried by the bridge, the skew angle is the angle between the centerline of the pier and the roadway centerline.¹

When a bridge is on a curve or if the angle of substructure unit varies, the average angle should be entered, if reasonable. Otherwise, enter "99" to indicate a major variation in angles of substructure units.

For features under the structure, the skew angle is the angle between the centerline of the bridge and the centerline of the feature.

¹ Pub. 238, Section IE 2.3.1, "The skew angle of a structure is the smaller angle between the highway centerline (or tangent thereto) and a line parallel to the support (wall, abutment, pier, etc.) or to the centerline of culverts."

Coding:

The skew angle to the nearest degree.

Examples:

<u>Skew Angle</u>	<u>Code</u>
85° 35'	86
45° 20'	45
90° 00'	90

*5B10 Structure Flared - Is the Structure Flared?

Inventory > Structure Home

Description:

This item indicates whether or not the width of the bridge varies.

Procedure:

Generally, such variance will result from ramps converging with or diverging from the through lanes on the bridge, but there may be other causes. Minor flares at the ends of the structure should be ignored. Select the code from the dropdown list that indicates if the width does or does not vary.

Coding:

- 0 No Flare
- 1 Yes, Flared

*5B11 Number of Main Spans - Total Number of Spans in Main Unit

Inventory > Structure Home

Description:

This item is used to record the number of spans in the main unit of a bridge.

Procedure:

Enter the number of spans in the main units of a bridge. It will include all spans of most bridges, the main unit of sizable structure or a unit of material or design different from that of the approach span. For a highway tunnel, enter "1" for the number of main unit spans.

Coding:

The number of spans.

*5B12 Main Span Material (FHWA)

Inventory > Structure Home

Description:

This item is used to indicate the Federal Highway Administration designation of the kind of material for the main unit of the bridge.

Procedure:

This item will be automatically filled in by the system based on information entered in items 6A26 & 6A28. This item should not be changed, but the calculated value should be confirmed.

Coding:

5B12 FHWA Coding

- 1 Concrete
- 2 Concrete continuous
- 3 Steel
- 4 Steel continuous
- 5 Prestress concrete
- 6 Prestress concrete continuous
- 7 Timber
- 8 Masonry
- 9 Aluminum, wrought iron, cast iron
- 0 Other

6A26 - 6A28, PennDOT Coding

- 2-1, 2-2, 2-8, 2-9, 3-1, 3-2, 3-8, 3-9
- 2-3, 2-4, 2-5, 2-6, 2-7, 2-A, 3-3, 3-4, 3-5, 3-6, 3-7, 3-A
- 1-1, 1-2, 1-8, 1-9, 8-*
- 1-3, 1-4, 1-5, 1-6, 1-7, 1-A
- 4-1, 4-2, 4-8, 4-9
- 4-3, 4-4, 4-5, 4-6, 4-7, 4-A
- 5-*
- 6-*
- 7-*
- 9-*

Note: An asterisk indicates 6A28 values 1 through 9 or A.

*5B13 Main Span Design - Structural Configuration of Main Span (FHWA)

Inventory > Structure Home

Description:

This item is used to indicate the Federal Highway Administration designation of the type of design and/or construction for the main unit of the bridge.

Procedure:

This item will be automatically filled in by the system based on information entered in item 6A29. This item should not be changed, but the calculated value should be confirmed.

Coding:

<u>5B13 FHWA Coding</u>	<u>6A29 PennDOT Coding</u>
01 Slab	1, 2, 38
02 Stringer/Multi-beam Girder	4, 9, 10, 36, 37
03 Girder and Floorbeam System	11, 12, 13, 14, 15, 16
04 Tee Beam	3
05 Box Beam or Girders - Multiple	7
06 Box Beam or Girders - Single	5, 6,
07 Frame	22
08 Orthotropic	23
09 Truss - Deck	17
10 Truss - Thru	18
11 Arch - Deck	19, 20
12 Arch - Thru	21
13 Suspension	24
14 Stayed Girder	25
15 Movable - Lift	26
16 Movable - Bascule	27
17 Movable - Swing	28
18 Tunnel	29
19 Culvert	30, 31, 32, 33, 34, 35
20 Mixed Types	None
21 Segmented Box Girder	52
22 Channel Beam	8
00 Other	39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 99

*5B14 Number of Approach Spans - Total Number of Approach Spans

Inventory > Structure Home

Description:

This item is used to record the number of approach spans to the main unit.

Procedure:

Enter the number of approach spans to the main unit or the number of spans of material different from that of the major bridge. If this item does not apply, code "0".

For a highway tunnel, an approach span is considered to be any length of the structure with a different material and/or type of construction than the main unit.

Coding:

The number of approach spans.

***5B15 Approach Span Material (FHWA)**

Inventory > Structure Home

Description:

This item is used to indicate the Federal Highway Administration designation of the kind of material for the approach spans of the bridge.

Procedure:

This item will be automatically filled in by the system based on information entered in item 6A26 and 6A28. This item should not be changed, but the calculated value should be confirmed.

Coding:

See item 5B12 for values.

***5B16 Structural Configuration of Approach Spans (FHWA)**

Inventory > Structure Home

Description:

This item is used to indicate the Federal Highway Administration designation of the type of design and/or construction for the approach spans of the bridge.

Procedure:

This item will be automatically filled in by the system based on information entered in item 6A29. This item should not be changed, but the calculated value should be confirmed.

Coding:

See item 5B13 for values.

***5B17 Maximum Span Length**

Inventory > Structure Home

Description:

This item is used to record the maximum span length.

Procedure:

Enter the length of the maximum span to the nearest foot. Measure between the center to center (c/c) of bearings along the centerline of the bridge. If only the clear open distance between piers, bents, or abutments is known, add the estimated distances from the face of the substructure elements to the centerline of bearing. For arch culverts under fill, span length is measured from springline-to-springline (same as 5B18).

Coding:

Length of the maximum span, to the nearest foot.

*5B18 Structure Length

Inventory > Structure Home

Description:

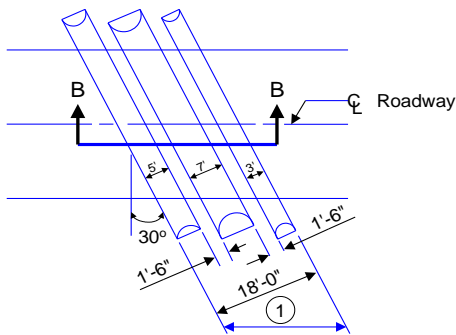
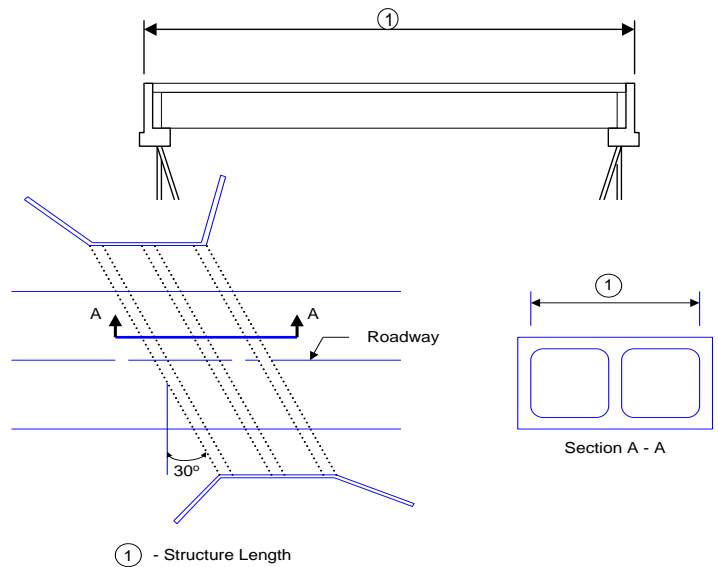
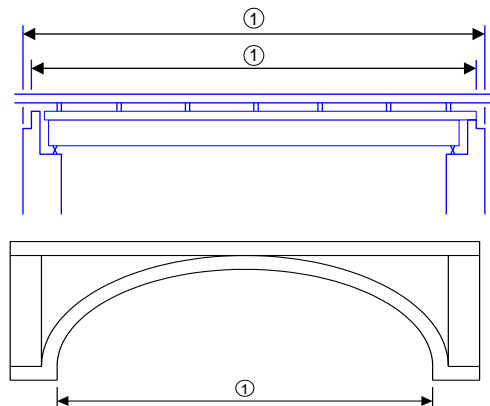
This item is used to record the total length of the structure.

Procedure:

Enter the total length of the structure to the nearest foot. This will normally be the length measured along the centerline of roadway from paving notch to paving notch or back to back of backwalls of abutments, if present. Otherwise, enter the length from end to end of the bridge floor, but in no case can this be less than the total clear opening of the structure. For culverts, including single or multiple boxes or pipes, etc., where the clear distance between multiple openings is less than half of the smaller contiguous opening, the measurement should be made between inside edges of the exterior pipes or inside faces of the exterior walls, if any, along the centerline of roadway regardless of their depth below grade. For culverts at grade (e.g., R.C. Box Culvert without fill), measurement should be along the centerline of roadway from paving notch to paving notch, if any, or back to back of exterior walls (see sketches below). If the structure is highway tunnel, enter the length of the tunnel measured along the centerline of the roadway. For walls, enter the length from beginning to end of the wall. Leave blank for structure mounted or cantilever sign structures. For cantilevered sign structures, enter the length from the centerline of support to the end of the arm. For non-cantilevered sign structures, enter the total length between the centerline of outer supports.

Coding:

Total length of the structure to the nearest foot.



$$\text{Structure Length} = \frac{18'}{\cos 30^\circ}$$

5B19 Deck Area

Inventory > Structure Home

Description:

This item is used to record the bridge's deck area in square feet.

Procedure:

This item will be automatically filled in by the system based on the product of the values entered in items 5B07 and 5B18. If a structure's 5B07 is equal to 0 (e.g. culverts under fill), this calculation will be based on 5C26 instead of 5B07. The automatic update occurs overnight.

Coding:

The deck area to the nearest square foot. This value will be set to 0 for non-bridge structures.

5B20 Total Length

Inventory > Structure Home

Description:

This item is used to record the total length of the structure, including approach roadways.

Procedure:

Enter the total length of the structure, including approach roadways. For the total structure length calculation, approach roadways consist of the approach slabs, if present. If approach slabs are not present, approach roadway length is zero. This value is always greater than or equal to the structure length.

Coding:

Input the total length of the structure, including approach roadways, to the nearest foot.

[the remainder of this page is intentionally left blank]

5C Inspection Inventory - Roads

The Inspection Inventory - Roads Screen shows roadway information for the selected structure. Use Screens FR and FW, respectively, to enter data for railroad and waterway features. For "under" features, only record the following items: 5C01, 5C03- 5C06, 5C08, 5C10-5C14, 5C18, 5C21, 5C23, 5C28, 5C29, 5C33.

5C01 Route Name - Road / Route Name

Inventory > Features > Roadway; Form A > Vertical Clearance

Description:

This item is used to record features intersected in narrative form.

Procedure:

Enter a narrative description of the features intersected by the bridge being inventoried, whether the features are on or under the bridge. Abbreviations should be used where necessary, but an effort should be made to keep them meaningful. For routes which are not state routes, the traffic route number should be recorded.

Coding:

Narrative description of the feature intersected.

Examples:

County Rd 39
Walnut St
Twp Rte T431
B&O Railroad

Refer to 5C03 Example 3 if structure is a tunnel.

5C02 (Not Used - Reserved for Future Use)

[the remainder of this page is intentionally left blank]

***5C03 On/Under - Is the Feature Intersected On or Under the Bridge? 🚧**

Inventory > Features; Form A > Vertical Clearance

Description:

This item indicates whether the feature intersected is on or under the bridge being inventoried.

Procedure:

Enter the code that indicates whether the feature intersected is on or under the bridge being inventoried.

When creating a new "on" or "under" select the appropriate route type.

For a tunnel, code the route going through the tunnel as the under feature.

When there is more than one feature under the bridge, order the routes according to the hierarchy given in item 5C04.

To the right of the display of Item 5C03 in BMS2 on the Features screen, a two digit RMS Key will be displayed if the feature is integrating with RMS. A blank key indicates that the feature is not integrating with RMS.

Coding:

- 1 - Feature is on the bridge
- 12 - Feature is the second feature on the bridge
- 2 - Only one feature under the bridge
- A to Z - Feature is one of multiple features under the bridge

Examples:

	Route Name (5C01)	On/Under (5C03)
1 - A bridge carrying SR 1206 with a single route, SR 2090 passing under it:	SR 1206	1 - Route On Structure
	SR 2090	2 - One Route Under
2 - A bridge carrying SR 3001 with routes, SR 1018 and SR 3018 passing under it:	SR 3001	1 - Route On Structure
	SR 1018	A - 1 st Route Under
	SR 3018	B - 2 nd Route Under
3 - A tunnel with SR 0376 passing through it:	Mt. Washington	1 - Route On Structure
	SR 0376	2 - One Route Under
4 - A bridge carrying two SRs (1206 & 3001) with a single route, SR 2090 passing under it:	SR 1206	1 - Route On Structure
	SR 3001	12 - 2 nd Route On
	SR 2090	2 - One Route Under

***5C04 Kind Hwy (Rte Pref) - Route Signing Prefix**

Inventory > Features > Roadway

Description:

This item indicates the kind of highway of the FEATURE.

Procedure:

This field is automatically filled in by the system if the feature integrates with RMS. For local and other routes, this item should be entered manually.

Select the code from the dropdown list which indicates the kind of highway. The order of the codes shown is also the hierarchy of their importance. If two or more routes are concurrent, first of the codes (reading down the list) will be used.

Coding:

- | | | | |
|---|---|---|---|
| 1 | Interstate Highway | 6 | Federal Lands Road |
| 2 | U.S. Numbered Highway | 7 | State Lands Road |
| 3 | State Highway | 8 | Other (routes not otherwise identified above) |
| 4 | County Highway | N | Not applicable (non-highway related features) |
| 5 | City, Borough Street and Township Roads | | |

***5C05 Desig. Lvl Service - Designated Level of Service**

Inventory > Features > Roadway

Description:

This item describes the designated level of service.

Procedure:

Select the code from the dropdown list which describes the feature.

Coding:

- | | | | |
|---|---------------|---|--|
| 0 | None of below | 6 | Business |
| 1 | Mainline | 7 | Ramp, Wye, Connector, etc. |
| 2 | Alternate | 8 | Service and/or unclassified frontage road |
| 3 | Bypass | N | Not applicable (non-highway related feature) |
| 4 | Spur | | |

***5C06 Rte #/Suffix - State Traffic Route / Suffix**

Inventory > Features > Roadway; Form A > Vertical Clearance

Description:

This two part item is used to record the traffic route number and directional suffix for the route on which the structure is being inventoried.

Procedure:

This field is automatically filled in by the system if the feature integrates with RMS. For local and other routes, this item should be entered manually.

Enter the traffic route number in Field 1. The traffic route number is the predominate highway route number posted along the highway. When two or more routes are concurrent, the highest of the hierarchy of KIND OF HIGHWAY (5C04) will be used. If the concurrent routes are of the same hierarchy level, the lowest numbered route will be used.

If the FEATURE is not a highway, code "NNNNN". If the FEATURE is a highway with no traffic route number, code "00000" for not applicable.

In Field 2, select the code from the dropdown list which indicates the directional suffix for the FEATURE described as highway, street, etc. If the FEATURE is a ramp, enter the direction of the route on which the traffic from the ramp will enter.

Coding:

Field 1 (route number):

The traffic route number



Example:

Interstate 78

U.S. 322

Highway with no traffic route number

Non-highway related feature

Ramps

Field 2 (suffix):

- 0 Traffic in both directions
- 1 Northbound
- 2 Eastbound
- 3 Southbound
- 4 Westbound
- N Not applicable (non-highway related features)

5C07 (Not Used - Reserved for Future Use)

***5C08 Lanes, Medians, Speed - Lanes On and Under the Structure / Medians on Structure / Speed**

Inventory > Features > Roadway; Form A > Traffic Safety Features

Description:

This series of three fields is used to record the number of highway traffic lanes open to the public on or under the structure, the number of medians on the structure, and the actual or posted speed of the roadway.

Procedure:

Code the number of highway lanes being carried by the structure or under the structure.

Include all lanes carrying highway traffic (cars, trucks, buses) which are striped or otherwise operated as a full width traffic lane for the entire length of the structure or under the structure by the owning and/or maintaining authority. This includes any full width merge lanes and ramp lanes, and is independent of

directionality of usage (i.e., a one lane bridge carrying two directional traffic is still considered to carry only one lane on the structure).

For each inventory route on the bridge, code the total number of lanes carried by all inventoried routes on the bridge.

For each inventory route under the bridge, code the number of lanes for that inventory route only. When the inventory route is under the bridge, the obstruction over the inventory route may be other than a highway bridge (railroad, pedestrian, pipeline, etc.). Code "00" if there are no highway lanes on the obstructing structure. Any feature with item 5C22 coded "NN", code 5C08 as "00" for that feature.

Code double deck bridges as 1 or 2 structures as noted in the examples. Either method is acceptable however, all related data must be compatible with the method selected.

Enter the number of medians in the roadway in Field 2. This item includes both mountable and non-mountable medians.

Enter the actual or posted speed of the roadway in Field 3. **This item will be automatically entered for state routes inventoried in RMS.** For local and other routes, this item should be entered manually.

Coding and Examples:

Field 1

1 lane on	<input type="text" value="1"/>	
3 lanes under	<input type="text" value="3"/>	
5 lanes on double deck each direction*		<input type="text" value="10"/>
5 lanes on double deck each direction **		<input type="text" value="05"/>
Railroad, pedestrian and/or private road on		<input type="text" value="00"/>

Center turn lanes carried full length across a bridge shall be considered through traffic lanes for this item and considered accordingly for Item 4A10 Deck Geometry Appraisal.

*Acceptable if coded as 1 bridge. However, other data (ADT, curb-to-curb width, etc.) must be for both decks.

**Acceptable if coded as 2 separate bridges. However other data (ADT, curb-to-curb width, etc.) must be for a single deck.

Field 2

Number of Medians on structure

Field 3

Actual or posted speed of roadway in mph.

5C09 ADT Class

Inventory > Features > Roadway

Description:

This item is used to record the traffic volume class of the roadway.

Procedure:

Leave this item blank until the Department provides further clarification.

*5C10 Recent ADT - Recent Average Daily Traffic 🚗

Inventory > Features > Roadway

Description:

This item is used to record the “current” average annual daily traffic volume.

Procedure:

This field is automatically filled in by the system if the feature integrates with RMS. For local and other routes, this item should be entered manually. If this information is not available, a best estimate is recommended.

Coding:

Number of vehicles per day.

*5C11 Year - Year of Average Daily Traffic

Inventory > Features > Roadway

Description:

This item is used to record the “current” year of the ADT.

Procedure:

This field is automatically filled in by the system if the feature integrates with RMS. For local and other routes, this item should be entered manually.

Coding:

The 4 digit year of the average annual daily traffic.

*5C12 Future ADT - Future Average Daily Traffic

Inventory > Features > Roadway

Description:

This item is used to record the forecasted average daily traffic (ADT) for the inventory route.

Procedure:

Future ADT shall be projected at least 17 years but no more than 22 years from the year data is submitted to the NBI. The intent is to provide a basis for a 20 year forecast. This item may be updated anytime, but must be updated when the forecast falls below the 17 year limit. If planning data is not available, use the best estimate based on site familiarity.

Future ADT must be compatible with other items coded for the bridge. For example, parallel bridges with an open median are coded as follows: if 5C08, Lanes on and Under the Structure, and 5C27, Bridge Roadway Width, curb-to-curb are coded for each bridge separately, then future ADT must be coded for each bridge separately (not total for the route).

Coding:

The future average daily traffic, in vehicles per day.

***5C13 Year - Year of Future Average Daily Traffic**

Inventory > Features > Roadway

Description:

This item is used to record the year of the future ADT in item 5C12.

Procedure:

The projected year of future ADT shall be at least 17 years but no more than 22 years from the year data is submitted to NBI.

Coding:

The 4 digit year of future average daily traffic.

***5C14 Truck %ADT - Average Daily Truck Traffic (Percent)**

Inventory > Features > Roadway

Description:

This is a 2 digit field used to indicate the percentage of ADT that is truck traffic.

Procedure:

This field is automatically filled in by the system if the feature integrates with RMS. For local and other routes, this item should be entered manually. If this information is not available an estimate which represents the average percentage for the category of road carried by the bridge may be used. Do not include vans, pickup trucks, and other light delivery trucks in this percentage. If the ADT is less than 100, leave this field blank.

Coding:

The percentage of ADT that is truck traffic.

***5C15 Detour Leng - Bypass Detour Length**

Inventory > Features > Roadway

Description:

This item is used to code the availability of a ground level bypass at a bridge site or to record the length of a detour which would result from closing of the bridge to highway traffic.

Procedure:

If a ground level bypass is available at the bridge site for the route, enter "00" in both positions. Otherwise, enter the actual length to the nearest mile of the feasible detour to the nearest comparable structure. If the bridge is one of twin bridges not at an interchange, code "01" to indicate that the other twin bridge can be used as a temporary bypass. In the other cases, enter the actual length to the nearest mile of the detour length. This item must be entered.

The detour length should represent the total additional travel for a vehicle, which would result from closing of the bridge.

The factor to consider when determining if a bypass is available at the site is the potential for moving vehicles, including military vehicles, around the structure, particularly, when the structure is in an interchange. For instance, a bypass likely would be available in the case of diamond interchanges, interchanges with service roads available, or other interchanges where the positioning and layout of the ramps is such that they could be used without difficulty to get around the bridge.

The detour route selected should be of an equal or better classification of highway, including any bridges located on the highway.

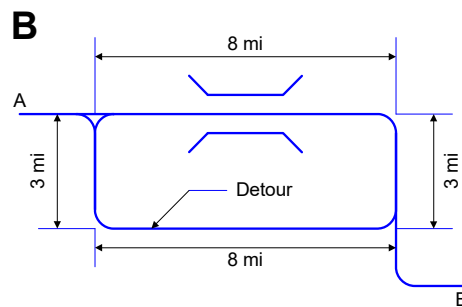
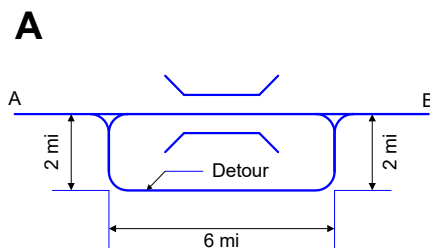
Enter this item for each ON feature of a bridge that carries highway traffic.

Coding:

- 0.00 Ground level bypass
- 01.00-98.00 Actual length of the detour route to the nearest mile
- 99.00 Detour length of 99 miles or more; or bridge on a dead-end road

Examples

Twin bridge used as a temporary bypass or additional travel length less than or equal to 1 mile.	1.00
Detour Figure A, 4 mile additional travel length	4.00
Bridge over river, 121 mile additional travel	99.00
Detour Figure B, 0 mile additional travel length	0.00



5C16 Speed - Detour Speed

Inventory > Features > Roadway

Description:

This item is used to record the lowest posted speed of the detour route in miles per hour (mph).

Procedure:

Enter the posted speed of the detour route.

Coding:

Posted speed of detour route in mph.

5C17 Accident Cnt, Rate - Accident Count and Rate

Inventory > Features > Roadway

Description:

This two part item indicates the average annual accident count and rate of the roadway.

Procedure:

Enter the average annual accident count of the roadway in Field 1.

In Field 2, enter the average annual accident rate of the roadway per 100 million vehicle miles traveled (VMT).

Leave this item blank until the Department provides further clarification.

*5C18 Kilometer/Mile Pt - Mile Point

Inventory > Features > Roadway

Description:

This item is used to record the location of the bridge along the inventory route.

Procedure:

The linear referencing system (LRS) mile point is used to establish the location of the bridge on the Base Highway Network (see Item 5C19). It must be from the same LRS Inventory Route and mile point system as reported in the Highway Performance Monitoring System (HPMS). The mile point coded in this item directly relates to Item 5C20 - LRS Inventory Route, Subroute Number.

This item must be coded for all structures located on or overpassing the Base Highway Network. Code a 7-digit number to represent the LRS mile point distance in miles to the nearest thousandth. For structures carrying the LRS Inventory Route, code the mile point at the beginning of the structure (i.e. the lowest mile point on the bridge). When the LRS Inventory Route goes under the structure (Item 5C03 coded 2 or A-Z), then code the mile point on the underpassing route where the structure is first encountered.

Coding:

Code all zeros in this field for all records where mile points are not provided. Mile points may be coded for bridges that are not located on the Base Highway Network, however Item 5C19 - Base Highway Network shall be coded 0 for these records.

***5C19 Nat Base Net - National Base Highway Network**

Inventory > Features > Roadway

Description:

This item indicates whether or not the inventory route is on the Base Network.

Procedure:

This field is **automatically filled in by the system if the feature integrates with RMS**. This item is to be coded for all records in the inventory. The Base Highway Network includes the through lane (mainline) portions of the NHS, rural/urban principal arterial system and rural minor arterial system. Ramps, frontage roads and other roadways are not included in the Base Network.

Coding

- 0 Not on Base Highway Network
- 1 On Base Highway Network

***5C20 LRS Inventory Rte, Sub# - LRS Inventory Route and Subroute Number**

Inventory > Features > Roadway

Description:

This two part item is used to record the inventory route and subroute numbers from the State's linear referencing system (LRS).

Procedure:

Leave this item blank. The Department submits this data to the FHWA based on traffic route information.

The LRS inventory route and subroute numbers to be reported in this item must correspond to the LRS inventory route and subroute numbers reported by the State for the HPMS. The LRS inventory route number is coded in the first field, while the subroute number, if it exists, is coded in the second field.

The LRS inventory route number can be alphanumeric, but must not contain blanks. The LRS inventory route number is not necessarily the same as that posted along the roadway, but is a number used to uniquely identify a route within at least a county and perhaps throughout the State. The subroute number is a number that uniquely identifies portions of an inventory route sections where duplicate mile points occur. These subroute numbers, if they exist, are identified in the State's HPMS-LRS records.

***5C21 Toll Facility**

Inventory > Features > Roadway

Description:

This item indicates whether or not the bridge is a toll facility, and whether it carries a toll highway. Interstate toll segments under Secretarial Agreement (Section 105 of the 1978 Federal-Aid Highway Act) shall be identified separately.

Procedure:

This field is **automatically filled in by the system** if the feature integrates with RMS. Select the code from the dropdown list that describes the toll status of the bridge. Leave this item blank if not applicable, i.e., when the bridge carries facilities other than a highway.

Coding:

- 1 Toll Bridge – tolls are paid specifically to use the structure
- 2 On Toll Road – the structure carries a toll road, that is, tolls are paid to use the facility which includes both the highway and the structure
- 3 On Free Road – the structure is toll free and carries a toll free highway
- 4 On Interstate Toll Segment Under Secretarial Agreement – structure functions as a part of the toll segment
- 5 Toll Bridge is a Segment Under Secretarial Agreement – structure is separate agreement from highway segment
- N/A Not Applicable

***5C22 Functional Class - Functional Classification**

Inventory > Features > Roadway; Form A > Vertical Clearance

Description:

This item indicates the Functional Classification of the highway.

Procedure:

Select the code from the dropdown list that indicates the functional classification of the highway.

This field is **automatically filled in by the system** if the feature integrates with RMS. For local and other routes, this item should be entered manually.

For features other than a highway, such as a railroad, pedestrian, cattle crossing, etc., code “NN” for not applicable. Features should only be coded as “99-Ramp” if the feature is a 9XXX route. 8XXX series features take on the functional class of the feature they service.

Coding:

<u>Rural</u>		<u>Urban</u>	
01	Rural Interstate	11	Urban Interstate
02	Rural Other Principal	12	Urban Other Freeway/Expressway
03	Rural Other Freeway/Expressway	14	Urban Other Principal
06	Rural Minor Arterial	16	Urban Minor Arterial
07	Rural Major Collector	17	Urban Major Collector
08	Rural Minor Collector	18	Urban Minor Collector
09	Rural Local	19	Urban Local
NN	Other	NN	Other
99	Ramp	99	Ramp

***5C23 Traffic Direction**

Inventory > Features > Roadway

Description:

This item is used to indicate the direction of traffic of the route identified.

Procedure:

This field is automatically filled in by the system if the feature integrates with RMS. Select the code from the dropdown list which indicates the direction of traffic.

Coding

- 0 Highway traffic not carried
- 1 1-way traffic
- 2 2-way traffic
- 3 One lane bridge for 2-way traffic

***5C24 Vertical - Vertical Clearance Over 10 Ft Width (Defense Highways)**

Inventory > Features > Roadway

Description:

This item is used to record the defense vertical clearance. The defense vertical clearance is defined as the maximum height a ten foot wide vehicle may be and still be able to pass along the feature being described.

Procedure:

This item will be automatically filled in by the system based on information entered in items 6C22 and 6C23. This item should not be changed, but the calculated value should be confirmed.

***5C25 Horiz - Total Horizontal Clearance**

Inventory > Features > Roadway

Description:

This item is used to record the total horizontal clearance for FEATURES which are identified as streets or highways.

Procedure:

This item will be automatically filled in by the system based on information entered in items 6C18 and 6C19. This item should not be changed, but the calculated value should be confirmed.

***5C26 Appr. Road - Width of Approach to the Bridge**

Inventory > Features > Roadway

Description:

This item is used to record the width of the roadway approaching the bridge.

Procedure:

The width is measured normal to the centerline of the roadway approaching the structure. Usable roadway width will include the width of traffic lanes and the widths of shoulders where shoulders are

defined as follows: shoulders must be constructed and normally maintained flush with the adjacent traffic lane, and must be structurally adequate for all weather and traffic conditions consistent with the facility carried. Unstabilized grass or dirt, with no base course, flush with and beside the traffic lane is not to be considered a shoulder for this item.

For structures with medians of any type and double decked structures, this item should be coded as the sum of the usable roadway width for the approach roadways (i.e., all median widths which do not qualify as shoulders should not be included in this dimension). When there is a variation between the approaches at either end of the structure, record and code the most restrictive (1) of the approach conditions.

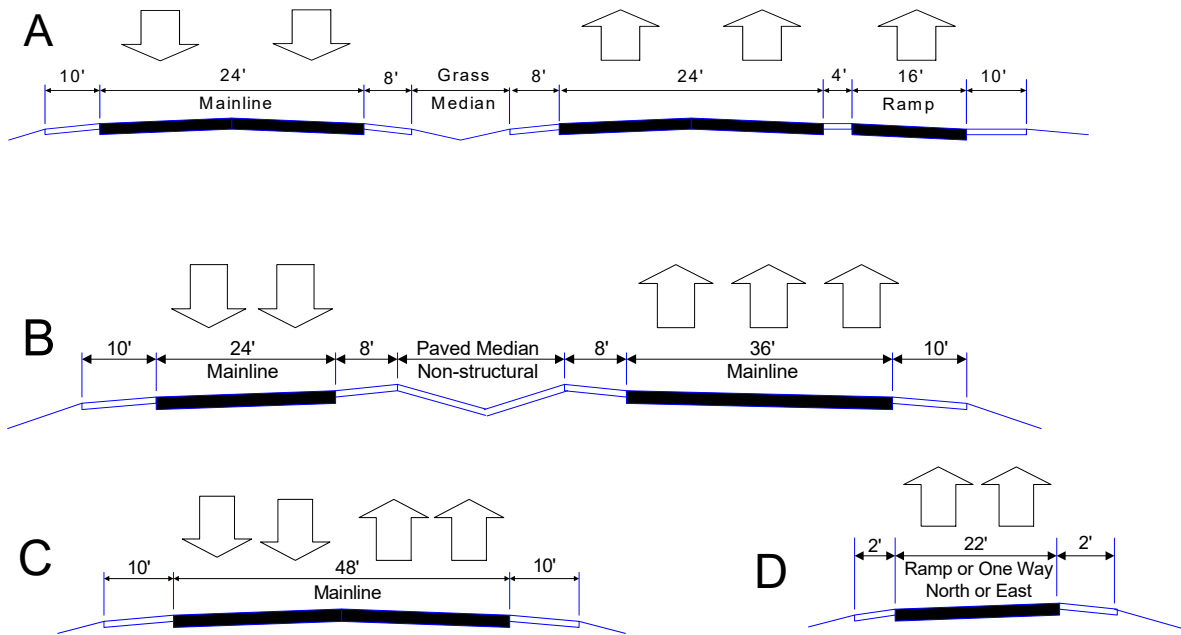
- (1) The most restrictive approach produces the largest algebraic difference between 5C26 and 5C27 (bridge roadway width c/c).

Coding:

Width of roadway approach to the bridge, to the nearest foot.

Example

	Left Shoulder	Left Roadway	Median	Right Roadway	Right Shoulder	Code
A	10.0	24	16	44	10.0	104
B	10.0	24	16	36	10.0	096
C	10.0	---	---	48	10.0	068
D	2.0	---	---	22	2.0	026



Regardless of whether the median is open or closed, the data coded must be compatible with other related route and bridge data (i.e., if 5C27 bridge roadway width, is for traffic in one direction only, then items 5C26, 5C10, 5C08, etc., must be for traffic in one direction only.) For “Left” and “Right” designations, refer to the Definitions Section. If a ramp is adjacent to the through lanes approaching the structure, include in the approach roadway width.

*5C27 Brdg Rdwy - Bridge Roadway Width, Curb to Curb

Inventory > Features > Roadway

Description:

This item is used to record the width between curbs or rails of the bridge roadway.

Procedure:

Enter the most restrictive minimum distance between curbs or rails on the bridge roadway. For structures with closed medians and usually for double decked structures, coded data will be the sum of the most restrictive minimum distances for all roadways carried by the structures. (Raised or non-mountable medians, open medians, and barrier widths are to be excluded from the summation along with barrier-protected bicycle and equestrian lanes.) The data recorded for this item must be comparable with other related route and bridge data (i.e., items 5C26, 5C10, 5A19, etc.). The measurement should be exclusive of flared areas for ramps. The distance should be recorded to the nearest tenth of a foot. See examples.

Where traffic runs directly on the top slab (or wearing surface) of a culvert type structure, e.g., an R/C box without fill, code the actual roadway width (curb-to-curb or rail-to-rail). This will also apply where the fill is minimal and headwalls or parapets affect the flow of traffic.

Where the roadway is on fill carried across a structure and the headwalls or parapets do not affect the flow of traffic, code "0000". This is considered proper in as much as a filled section simply maintains the roadway cross-section. See sketches following item 5B05.

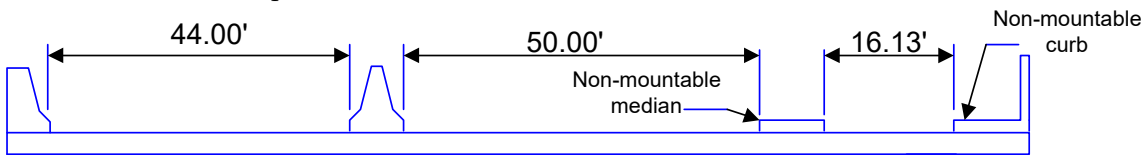
Coding:

Curb to curb width to the nearest tenth foot.

Examples:

Bridge Roadway Width	
66.37' wide	66.400
110.13' wide	110.100

The last example above would be the coded value for the deck section shown below.



*5C28 Defense Hwy - Defense Highway Designation

Inventory > Features > Roadway

Description:

This item is used to indicate strategic highway network (STRAHNET) conditions.

Procedure:

This field is automatically filled in by the system if the feature integrates with RMS. For the inventory route, use the codes below. For the purposes of this item, the STRAHNET Connectors are considered included in the term STRAHNET.

Coding:

- 0 The inventory route is not a STRAHNET route
- 1 The inventory route is a STRAHNET route
- 2 The inventory route is a STRAHNET route that goes over or under a STRAHNET route
- 3 The Inventory route is on a STRAHNET connector route.

***5C29 Nat. Hwy Sys - National Highway System**

Inventory > Features > Roadway; Form A > Vertical Clearance

Description:

This item indicates the National Highway System (NHS) of the inventory route.

Procedure:

This field is automatically filled in by the system if the feature integrates with RMS . For local and other routes, this item should be entered manually.

Coding:

- 0 The inventory route **is not** on the National Highway System
- 1 The inventory route **is** on the National Highway System

5C30 SB - School Bus Route

Inventory > Features > Roadway

Description:

This checkbox field indicates whether or not the roadway is used by school buses.

Procedure:

If the roadway is used by school buses, the box should be checked. If the roadway is not used by school buses, the box should be unchecked.

Coding:

- Unchecked The roadway is not used by school buses
- Checked The roadway is used by school buses

***5C31 Fed. Lands Hwy - Federal Lands Highway**

Inventory > Features > Roadway

Description:

This item indicates what type of federal land, if any, the inventory route leads to and traverses through.

Procedure:

Structures owned by State and local jurisdictions on roads which lead to and traverse through federal lands sometimes require special coded unique identification because they are eligible to receive funding from the Federal Lands Highway Program.

Coding:

0	Not applicable	4	Both IRR and FH
1	Indian Reservation Road (IRR)	5	Both IRR and LMHS
2	Forest Highway (FH)	6	Both FH and LMHS
3	Land Management Highway System (LMHS)	9	Combined IRR, FH and LMHS

5C32 Trans - Transit Bus Route

Inventory > Features > Roadway

Description:

This checkbox field indicates whether or not the roadway is used by public transit such as local or long distance scheduled buses or trolleys, etc.

Procedure:

If the roadway is used by public transit, the box should be checked. If the roadway is not used by public transit, the box should be unchecked.

Coding:

Unchecked	The roadway is not used by public transit
Checked	The roadway is used by public transit

***5C33 Nat Truck Network - National Truck Network**

Inventory > Features > Roadway

Description:

This item is used to indicate whether or not the route is part of the national network for trucks. The national network for trucks includes most of the interstate system and those portions of the Federal-Aid Primary System identified in the Code of Federal Regulations (23 CFR 658). The national network for trucks is available for use by commercial motor vehicles of the dimension and configurations described in these regulations.

Procedure:

This field is **automatically filled in by the system** if the feature integrates with RMS. For the route being described, indicate whether or not the route is part of the National Truck Network by using the codes below.

Coding:

0	The inventory route is not part of the national network for trucks
1	The inventory route is part of the national network for trucks

5C34 Emer - Emergency Indicator

Inventory > Features > Roadway

Description:

This checkbox field indicates whether or not the roadway is on a critical travel route.

Procedure:

If the roadway is on a critical travel route, the box should be checked. If the roadway is not on a critical travel route, the box should be unchecked.

Coding:

Unchecked	The roadway is not on a critical travel route
Checked	The roadway is on a critical travel route

5C35 RMS Roadway BPN

Inventory > Features > Roadway

Description:

This item indicates the BPN for each roadway feature that integrates with RMS.

Procedure:

For routes that integrate with RMS, the "RMS Roadway BPN" designation is displayed based on information obtained from RMS.

Coding:

1	Interstate Routes
2	Other NHS Routes (Non-Interstate)
3	Non-NHS Routes with ADT > 2000
4	Other Non-NHS Routes
Blank	The roadway feature does not integrate with RMS

5C36 Adjoining Feature

Inventory > Features > Roadway

Description:

This dropdown box is used to identify adjoining features that change route number beneath an overhead structure. The field will only appear on "under" features as coded in Item 5C03.

Procedure:

If the roadway changes route numbers beneath an overhead bridge, select the adjoining feature from the drop down list. Only under features as indicated in Item 5C03 will be listed in the drop down menu. A route can only be joined within one other route. The purpose of this field is to ensure the proper calculation of Item 5A19 - Number of Lanes Under.

Coding:

Adjoining Feature from available entries.

5C37 (Not Used - Reserved for Future Use)

5C38 (Not Used - Reserved for Future Use)

5C39 (Not Used - Reserved for Future Use)

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5D Inspection Inventory - Structure Units

The Inspection Inventory - Structure Units Screen describes the structure units of the selected structure.

Structure units serve multiple purposes:

- Bridge elements must be assigned to a structure unit.
- Structure units must be defined for substructure units so that underwater inspection data may be recorded.
- APRAS span ID

5D01 Unit Key

Inventory > Structure Unit > Span Detail

Description:

This display only item indicates the structure unit key for the unit.

Procedure:

This item is used internally by the system and requires no input from the bridge inspector.

5D02 Unit ID - Structure Unit ID

Inventory > Structure Unit > Span Detail; Form D and Form E

Description:

This item is used to record the identification number of the structure unit.

Procedure:

Enter the ID for the structure unit. Each span of the structure should be coded as an individual structure unit so that the structure unit ID corresponds to the span number. Each substructure unit (e.g. abutment, pier, culvert, etc...) shall be entered as a structure unit so that they may appear on the Inspection Underwater screen.

Use abutment and pier codes for single and multi-cell culverts without floors (6A29 = 30 or 32). Use culvert in and culvert (CIN and COU) coding for culverts with a bottom (6A29 = 31, 33, 34, or 35). Additional coding guidance is provided in the coding of Field 6A29.

Coding:

When 5D04 is equal to "A - Approach" or "M - Main" enter the Span number.

When 5D04 is equal to "X - APRAS Span" enter the four-digit APRAS span identification number. See item SS01 for coding.

When 5D04 is equal to "B - Abutment" enter one of the following:

NAB Near Abutment
FAB Far Abutment

When 5D04 is equal to "W - Wingwall" enter one of the following:

WNL Wingwall, Near Left
WNR Wingwall, Near Right
WFL Wingwall, Far Left
WER Wingwall, Far Right

When 5D04 is equal to "C - Culvert" enter one of the following:

CIN Culvert Inlet
COU Culvert Outlet

When 5D04 is equal to "P - Pier" enter the Pier number as follows:

P01-P99 Number of Pier

When 5D04 is equal to "F - Frame" enter one of the following or leave blank:

Bridge Bridge
Sign Sign Structure
Wall Retaining wall or Noise wall

5D03 Structure Unit Description

Inventory > Structure Unit > Span Detail

Description:

This item is used to record a narrative description of the structure unit.

Procedure:

Enter a narrative description of the structure unit.

Examples:

"Main Span", "Approach Span"

5D04 Type - Structure Unit Type

Inventory > Structure Unit > Span Detail; Form E

Description:

This item is used to indicate the type of structure unit.

Procedure:

Select the appropriate structure unit type from the dropdown list. All structures carrying a highway must have at least one "M - Main Span". This includes culverts. Otherwise, elements cannot be entered and evaluated on the given structure. When a structure is created, this unit is automatically created.

Coding:

M Main Span - This coding will include all spans for most bridges, the main units of a sizeable structure or a change of material or the design methodology different from the approach spans.
A Approach Span - This coding will include secondary spans which differ from the main span(s) in material or design
B Abutment - This coding is for the Near and Far Abutments
C Culvert - This coding is for Culvert In (CIN) and Culvert Out (COU).
F Frame - Frame represents the structure unit for the entire bridge. Sign Structures and Walls should be classified as the Frame structure unit.
P Pier - Piers need to be defined in order to be included in item IN01 for selection
W Wingwall - Wingwalls need to be defined as structure units if they are to be included in the dropdown menu for item IN01.
X APRAS Span - Each span to be analyzed in APRAS must be assigned to a structure unit.
O Other - The Other structure unit shall only be used when none of the previously mentioned structure units apply. This coding should be used sparingly.
Blank Not Applicable

5D05 Default Bridge Unit - Default Bridge Unit Indicator

Inventory > Structure Unit > Span Detail

Description:

This checkbox field is used to indicate that the current structure unit will be the default structure unit for the structure.

Procedure:

Check or uncheck the box to indicate if the current structure unit should or should not be the default structure unit for the structure. Only one structure unit may be selected as the Default Bridge Unit at any time. When creating new bridge elements on screens 1A and 1B, the new elements will be automatically assigned to the Structure Unit that has the Default Bridge Indicator checked if Item 1B02 is left blank. Ensure that the appropriate structure unit is selected as the Default Bridge Unit. New elements should only be assigned to Main and Approach Span structure units.

Coding:

Unchecked	The current structure unit is not the default structure unit
Checked	The current structure unit is the default structure unit

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5E Inspection Inventory - Classification

The Inspection Inventory - Classification Screen describes the bridge classification and allows user defined fields for the Agency.

*5E01 NBIS Bridge Len - NBIS Bridge Length

Inventory > Structure Home

Description:

This item indicates whether the structure meets or exceeds the minimum length specified to be designated as a bridge for National Bridge Inspection Standards *NBIS purposes. The following definition of a bridge is used by AASHTO and is given in the NBIS, 23 CFR 650.305:

"A structure including supports erected over a depression or an obstruction, such as water, highway, or railway, and having a track or passageway for carrying traffic or other moving loads, and having an opening measured along the center of the roadway of more than 20 feet between undercopings of abutments or spring lines of arches, or extreme ends of openings for multiple boxes; it may also include multiple pipes, where the clear distance between openings is less than half of the smaller contiguous opening."

This field can also be used to identify structures not applicable for the NBI submittal list. For example, structures with a service type on (5A17) of 2 - Railroad, 3 - Pedestrian, H - High Mast Light, M - Misc. Structure, N - Noise Wall, R - Retaining Wall, S - Sign Structure or T - Tunnel should be coded as not meeting the NBIS length, regardless of their structure length. This field should also be coded as "N" for structures with a structural configuration (6A29) = 29 - Tunnel.

Note:

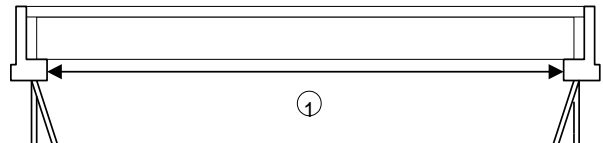
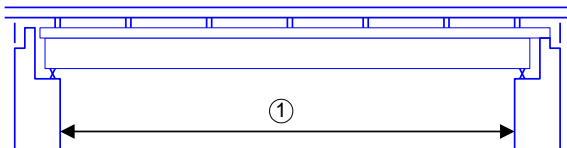
The NBIS length is not necessarily the same length as the structure length (Item 5B18).

Procedure:

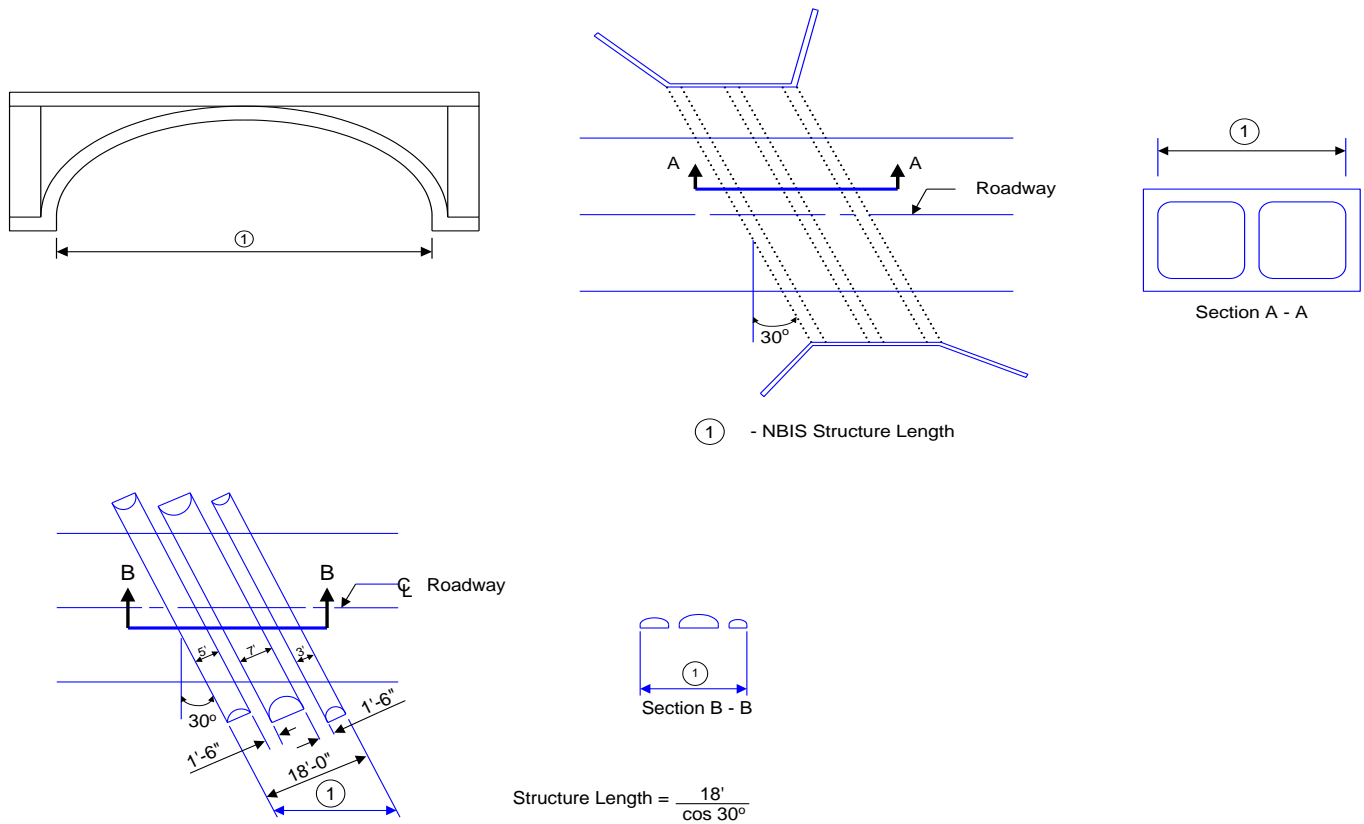
Select the appropriate code from below based on the above definition and the sketches below. *Coding:*

Y Yes, the structure meets or exceeds the minimum NBIS length

N No, the structure does not meet the minimum NBIS length and/or does not qualify for the NBI submittal.



Additional sketches provided on the following page



***5E02 Parallel Structure**

Inventory > Structure Home

Description:

This item is used to indicate situations where separate structures carry the inventory route in opposite directions of travel over the same feature. The lateral distance between structures has no bearing on the coding of this item.

Procedure:

Select the appropriate code from the dropdown list.

Coding:

- R The right structure of parallel bridges carrying the roadway in the direction of the inventory.
- L The left structure of parallel bridges. This structure carries traffic in the opposite direction.
- N No parallel structure exists.

***5E03 Temporary Struct - Temporary Structure**

Inventory > Structure Home

Description:

This item indicates situations where temporary structures or conditions exist.

Procedure:

Temporary structures or conditions are those which are required to facilitate traffic flow. This may occur either before or during the modification or replacement of a structure found to be deficient. Such conditions include:

1. Bridges shored up, including additional temporary supports.
2. Temporary repairs made to keep a bridge open.
3. Temporary structures, temporary runarounds or by-passes.
4. Other temporary measures, such as barricaded traffic lanes to keep a bridge open.

Any repaired structure or replacement structure which is expected to remain in place without further project activity, other than maintenance, for a significant period of time (e.g. greater than 6 years) shall not be considered temporary. Under such conditions, that structure, regardless of its type, shall be considered the minimum adequate to remain in place and evaluated accordingly.

Coding:

T Temporary structure(s) or conditions exist.
 Blank Not Applicable

If the item is coded "T", then all data recorded for the structure shall be for the condition of the structure without temporary measures, except for the following items which shall be for the temporary structure:

5C27	Bridge Roadway Width
4A19/4A20	Minimum Lateral Underclearance on the Left and Right
6C18/6C19	Inventory Route, Total Horizontal Clearance for Left and Right Roadways
6C20/6C21	Inventory Route, Minimum Vertical Clearance for Left and Right Roadways
VP02	Structure Open, Posted, or Closed to Traffic
VP03	Special Restrictive Posting (if applicable)
VP04	Posted Load Limits (if applicable)
VP01	Date Bridge Was Posted
VP06	Reason for Posting or Closing the Bridge
4B03	Bridge Capacity Appraisal
4A10	Deck Geometry (dependent on 5C27)

***5E04 Hist Significance - Historical Significance**

Inventory > Structure Home

Description:

This item is used to indicate the historical significance of the bridge and involves a variety of characteristics: the bridge may be a particularly unique example of the history of engineering; the crossing itself might be significant; the bridge might be associated with a historical property or area; or historical significance could be derived from the fact that the bridge was associated with significant events or circumstances.

Procedure:

This field is automatically filled in by the system if the structure integrates with CRGIS and will be displayed as a read-only value. If the structure does not integrate with CRGIS, the field will be editable and should be coded as follows:

Coding:

- 1 Bridge is on the National Register of Historic Places.
- 2 Bridge is eligible for National Register of Historic Places.
- 3 Bridge is possibly eligible for the National Register of Historic Places (requires further investigation before determination can be made) or bridge is on a state or local historical register
- 4 Historical significance is not determinable at this time.
- 5 Bridge is not eligible for the National Register of Historic Places.
- 6 Bridge superstructure has been removed or replaced

5E05 SHPO Key Number - State Historic Preservation Office Key Number

Inventory > Structure Home

Description:

This display only item indicates the 6 digit SHPO (State Historic Preservation Office) Key Number of the record stored in CRGIS.

Procedure:

This field is automatically filled in by the system if the structure integrates with CRGIS.

Coding:

- ##### Six digit number if the structure integrates with CRGIS
- Not in CRGIS Displayed when the structure is not integrating with CRGIS

5E06 to 5E09 (Not Used - Reserved for Future Use)

5E10 ACM Status - Asbestos Containing Material (ACM) Status

Inventory > Structure Home

Description:

This item is used to indicate the status of the ACM evaluation.

Procedure:

Enter the appropriate code.

Coding:

- A No ACM contained or ACM found is below threshold values (Highway bridges > 20', owned by the Department and locals)
- B ACM content is not known and investigation is needed
- C Investigations are complete and ACM is present on bridge (may be greater than or less than threshold values)
- M Miscellaneous structures (walls, sign structures, etc.) excluded from ACM evaluation
- X Structures excluded from ACM evaluations (Non-NBIS bridges and bridges < 20')
- Z Other NBIS bridges > 20' owned by toll facilities and other agencies
- ? New bridges or highway bridges whose NBIS statuses are unknown

5E11 IR - ACM Inspections Required

Inventory > Structure Home

Description:

This item is used to indicate the number of ACM inspections required.

Procedure:

Enter the number of locations on the bridge (e.g. occupancies, railroad spans) that require ACM inspections.

Coding:

Number of ACM inspections required.

5E12 IC - ACM Inspections Completed

Inventory > Structure Home

Description:

This item is used to indicate the number of ACM inspections that have been completed.

Procedure:

Enter the number of locations on the bridge where the required ACM inspections are completed.

Coding:

Number of ACM inspections completed.

5E13 ACM Insp Date - ACM Inspection Date

Inventory > Structure Home

Description:

This item is used to indicate the date of the last completed ACM inspection, regardless of findings.

Procedure:

Enter the date of the last completed ACM inspection.

Coding:

Enter the month, day and year in the following format: MMDDYYYY

5E14 ACM Qty - ACM Quantity

Inventory > Structure Home

Description:

This item is used to indicate the quantity of ACM on the structure.

Procedure:

Enter the appropriate code for the quantity of ACM based on the inspection findings.

Coding:

>THRES ACM inspection determined 1 or more locations have ACM > threshold values

<THRES	ACM inspection determined all locations have ACM < threshold values
NO_ACM	No ACM used in bridge or components
UNKNWN	Required ACM inspections not completed
ZZZZZZ	Structure not evaluated through ACM effort

5E15 ACM Num Loc - ACM Number

Inventory > Structure Home

Description:

This item is used to indicate the number of locations where ACM may be present.

Procedure:

Initially, enter the number of locations where ACM may be present. During investigations, the number should indicate the locations where inspections are incomplete or have ACM > threshold. After ACM investigations are complete, record only the number of locations ACM exceeds threshold values.

5E16 & 5E17 ACM Loc Desc 1&2 - ACM Locations

Inventory > Structure Home

Description:

This field is used to indicate the locations where ACM may be present.

Procedure:

Initially, enter the name of locations (occupancies, bridge components) where ACM may be present. After ACM investigations are complete, record only the locations where ACM exceeds threshold values. This should match data in item 5E15.

5E18 - 5E23 (Not Used - Reserved for Future Use)

These fields are no longer editable in BMS2. However, some Districts stored data in these fields and the data is available via a query.

5E24 Bridge Group

Inventory > Structure Home

Description:

This item identifies structures that are a part of a specific group of bridges, such as the P3 project. These groups will be added at the discretion of the BMS2 Manager.

Procedure:

Select the appropriate code from the dropdown list.

Coding:

P3 Structure is part of the P3 replacement project

6A Agency Bridge

The Agency Bridge screen contains general identification and structural characteristic information for a bridge. Information should be entered for each bridge being inventoried. Not all items are applicable to all structures in the database; the items that are not applicable should be left blank.

Agency ID

Inventory > Agency Bridge

Description:

This field allows local and agency owners to uniquely identify a structure using their own identifier.

Procedure:

Enter a unique name to identify the bridge. For example, "County Bridge #68."

Coding:

A narrative description of the local or agency owner unique name for the structure. This is an optional field as not all owners use a unique name for each structure other than the BRKEY or BMS ID.

6A01 Senat Dist - State Senatorial District

Inventory > Agency Bridge

Description:

This two part item specifies the Senatorial District Number for the bridge.

Procedure:

This item will be automatically entered by the system for state routes based on data that it obtains from RMS. For local and other routes, this item should be entered manually.

Coding:

Senatorial District Number assigned to the geographic area in which the bridge resides. For bridges that cross District borders, both District codes will be displayed (one in each item). For local bridges or to confirm state bridge information, users can find the State Senatorial District at <http://www.legis.state.pa.us/>

6A02 Cong Dist - United States Congressional District

Inventory > Agency Bridge

Description:

This two part item specifies the United States Congressional District Number assigned to the geographic area in which the bridge resides.

Procedure:

This item will be automatically entered by the system for state routes based on data that it obtains from RMS. For local and other routes, this item should be entered manually.

Coding:

United States Congressional District Number assigned to the geographic area in which the bridge resides. For bridges that cross District borders, both District codes are displayed (one in each field). For local bridges or to confirm state bridge information, users can find the United State Congressional District at <http://www.house.gov/>

6A03 Leg Dist - Legislative District

Inventory > Agency Bridge

Description:

This two part item specifies the Legislative District Number for the bridge.

Procedure:

This item will be automatically entered by the system for state routes based on data that it obtains from RMS. For local and other routes, this item should be entered manually.

Coding:

Legislative District Number assigned to the geographic area in which the bridge resides. For bridges that cross District borders, both District codes are displayed (one in each field). For local bridges or to confirm state bridge information, users can find the Legislative District at <http://www.legis.state.pa.us/>

6A04 Bndy - County or Municipal Boundary Intersecting Bridge

Inventory > Agency Bridge

Description:

This item is used to record the county or municipal boundary that intersects the bridge.

Procedure:

Select the code that describes the highest type of political boundary that intersects the bridge. The coding is arranged in order of decreasing hierarchy.

Coding:

- | | | | |
|---|----------------------------------|---|-------------------|
| 1 | State line | 4 | City or Boro line |
| 2 | County Engineering District line | 5 | Township line |
| 3 | County line with District | N | None of the above |

6A05 Util Present - Utilities Present on the Structure

Inventory > Agency Bridge

Description:

This checkbox field indicates whether or not utilities are present on the structure.

Procedure:

If there are utilities present on the structure, the box should be checked to indicate "yes". If there are no utilities present on the structure, the box should be unchecked to indicate "no".

Coding:

Unchecked	No utilities present on structure
Checked	Utilities are present on structure

6A06 Sub Agency - Agency Submitting Structure Inventory Record

Inventory > Agency Bridge

Description:

This item identifies the agency responsible for preparing and submitting the Structure Inventory Record.

Procedure:

Select the appropriate code from the dropdown list.

Coding:

D + 2 digit district number	Department District Office
0 (zero) + 2 digit county code	County, see 5A01
3 digit local county subdivision code	City/Borough/Township, see 5A06
P + 2 digit railroad number	Railroad, see FR01

PTC	Pennsylvania Turnpike Commission	PHMC	PA Historical and Museum Commission
DRC	Delaware River Joint Toll Bridge Commission	PSU	Pennsylvania State University
DPA	Delaware River Port Authority	OSA	Other State Agency (not defined above)
BBC	Burlington County Bridge Commission	NJS	New Jersey DOT
DCNR	PA Department of Conservation and Natural Resources	NYS	New York DOT
DGS	PA Department of General Services	FHW	Federal Agency
DOE	PA Department of Education	OPA	Other Private Agency
DOH	PA Department of Health	OTH	Other Agency
DHS	PA Department of Human Services		
DMVA	PA Department of Military and Veteran Affairs		

6A07 Fed Fund - Federal Funding Code

Inventory > Agency Bridge

Description:

This item indicates whether or not a bridge was built or reconstructed with federal funds.

Procedure:

If the bridge was built or reconstructed with federal funds, select the code "1". If no federal funds were used, code "0" (zero) for not applicable.

Coding:

- 0 No Federal Funding
- 1 Federal Funding

6A08 (Not Used - Reserved for Future Use)**6A09 Critical Facility**

Inventory - Agency Bridge

Description:

This checkbox field indicates whether or not the bridge is a critical facility.

Procedure:

A structure on a designated defense highway is considered to be a critical facility, which is defined in Title 23 CFR Part 470.

Coding:

- Checked Bridge is a critical facility
- Unchecked Bridge is not a critical facility

6A10 Flood Insp - Flood Inspection

Inventory > Agency Bridge

Description:

This checkbox field is used to identify structures that shall be inspected after heavy rainfall or flooding occurs.

Procedure:

Check or uncheck box to indicate the appropriate code.

Coding:

- Checked Yes, the structure should be inspected shortly after a heavy rainfall or flooding
- Unchecked No, there is no immediate need to perform special inspection due to heavy rain or flooding

Notes:

Item 4A08 can be used to help code this item.

Box should be unchecked if 4A08 is N, 9, 8, 7 or 5

Box should be checked if 4A08 is 4, 3, 2 or 1

Use judgment if 4A08 is coded "6", taking into consideration IN13 and IN03.

6A11 Covered Bridge - Covered Bridge Indicator

Inventory > Agency Bridge

Description:

This checkbox field indicates whether or not the bridge is a covered timber bridge that carries vehicular traffic

Procedure:

Check or uncheck box to indicate the appropriate code.

Coding:

Checked Yes, the bridge is a covered timber bridge and carries vehicular traffic
 Unchecked No, the bridge is not a covered timber bridge or does not carry vehicular traffic.

6A12 Dem/Repl Ind - Demolished/Replaced Indicator

Inventory > Agency Bridge

Description:

This checkbox field indicates whether or not the bridge was demolished/replaced.

Procedure:

This box is **automatically checked** if the posting status (VP02) is set to "X - Demol/Replaced". Check or uncheck box to indicate the appropriate code. This item **must** be checked for a bridge that has been demolished/replaced.

Coding:

Checked Bridge has been demolished/replaced
 Unchecked Bridge has not been demolished/replaced

6A13 Dem/Repl Dt - Demolished/Replaced Date

Inventory > Agency Bridge

Description:

This item is used to record the date on which the bridge was demolished/replaced.

Procedure:

This date is **automatically entered** if the posting status (VP02) is set to "X-Demol/Replaced". Enter the date on which the bridge was demolished/replaced.

Coding:

Date in MM/DD/YYYY format:

MM 2 digit month
 DD 2 digit day of month
 YYYY 4 digit year
 00/00/0000 Not applicable

6A14 Hist Dist Cont - Historic District Contribution Indicator

Inventory > Agency Bridge

Description:

This checkbox field indicates whether or not the structure contributes to the Historic District for planning purposes.

Procedure:

Check or uncheck box to indicate the appropriate code.

FHWA and EQAD determine eligibility. Eligibility is different for individual historic bridges than for those in Historic Districts. This field cannot be Yes (checked) if the historic district name is unknown or N/A.

Coding:

Checked	Yes, the structure contributes to the Historic District
Unchecked	No, the structure does not contribute to the Historic District

6A15 Hist Dist - Historic District

Inventory > Agency Bridge

Description:

This item is used to record the name of the Historic District in which the structure is located.

Procedure:

Enter the name of the Historic District.

Coding:

Name of Historic District.	
Unknown	Structure is located within a Historic District, but District name is unknown.
N/A	Structure is not located within a Historic District.

6A16 Preserv Candidate - Preservation Candidate Indicator

Inventory > Agency Bridge

Description:

This checkbox field indicates whether or not the structure is a candidate for Preservation.

Procedure:

Check or uncheck box to indicate the appropriate code.

Coding:

Checked	Yes, the bridge is a candidate for Preservation
Unchecked	No, the bridge is not a candidate for Preservation

6A17 Future Bridge Bill - Future Bridge Bill Candidate Indicator

Inventory > Agency Bridge

Description:

This checkbox field indicates whether or not the structure is a future bill candidate.

Procedure:

Check or uncheck box to indicate the appropriate code.

Coding:

Checked Yes, the bridge is a future bill candidate
 Unchecked No, the bridge is not a future bill candidate

6A18 Network

Inventory > Agency Bridge

Description:

This item is used to record the roadway network within which the structure is located.
 This item is reserved for future use.

Procedure:

N/A

Coding:

Reserved for Future Use

6A19 Bus Plan Ntk - Business Plan Network

Inventory > Agency Bridge

Description:

This item indicates the Business Plan Network of the feature carried by the bridge.

Procedure:

This field is **automatically filled in by the system** when at least one of the ON features integrates with RMS. If multiple ON features integrate with RMS, this field will be the controlling value from Field 5C35 from the ON features that integrate with RMS. Select the appropriate code from the dropdown list when the field is not automatically populated by RMS.

Coding:

1	Interstate Routes	D	DCNR Bridges
2	Other NHS Routes (Non-Interstate)	H	Local network (NHS)
3	Non-NHS Routes with ADT > 2000	L	Local network (Non-NHS)
4	Other Non-NHS Routes	N	Walls, Signs and Lights
		T	Turnpike

6A20 Watershed - Watershed Name

Inventory > Agency Bridge

Description:

This item is used to record the name of the watershed within which the structure is located.
This item is reserved for future use.

Procedure:

N/A

Coding:

Reserved for Future Use

6A21 De-Ice Equip - Deicing Equipment Description

Inventory > Agency Bridge

Description:

This item is used to describe any deicing equipment installed on the structure.

Procedure:

Select the type of deicing equipment installed on the structure.

Coding:

F FAST (Fixed Automated Spray Technology)
N Not Applicable

6A22 Corridor

Inventory > Agency Bridge

Description:

This item is used to record the corridor within which the structure is located.
This item is reserved for future use.

Procedure:

N/A

Coding:

Reserved for Future Use

*6A23 Owner Desc - Owner Description

Inventory > Agency Bridge

Description:

This item is used to record the owner or principal custodian of the bridge in a narrative form.

Procedure:

Enter the name of the owner or principal custodian of the bridge. In the absence of a clear designation of ownership, enter the name of principal custodian, the agency responsible for maintaining the structure.

(Agency maintaining only the roadway surface, curbs, sidewalks, and/or railings of similar minor items should not be considered as principal agency).

Coding:

A narrative description of the owner or principal custodians of the bridge. The description should include all owners/principal custodians listed in declining order of magnitude of ownership.

6A24 Trnback Desc - Turnback Description

Inventory > Agency Bridge

Description:

This item is used to describe the turnback of the state-owned structure to a local owner, or a locally owned structure to the Department.

Procedure:

Enter a description of the turnback of the structure.

Coding:

Enter a narrative description of the turnback. Notes such as the date of the turnback, the municipality, and any other pertinent information should be entered here.

6A25 (Not Used - Reserved for Future Use)

***6A26 Material - Material Used for Main Unit, Approach Unit, Sign Structure and Walls (Department)**

Inventory > Agency Bridge; Form A > Structure Description; Form F

Description:

This two part item is used to indicate the kind of material used for the main load carrying members for the main unit and approach unit of bridges and culverts. Material used for sign structure and walls shall be coded in the main unit field only.

Procedure:

Select the material type for each unit from the dropdown list. The main unit applies to all spans of most bridges, to the major unit of sizable structures or to a unit of material or design different from that of the approach spans.

For sign structures and walls, select the appropriate material type from the dropdown list. The materials codes for sign structures and walls are the same as for bridges.

Coding:

Main Members are any primary load carrying members that span between substructure supports.

- | | |
|--------------------------------------|-------------------------------------|
| 1 Steel | 6 Masonry |
| 2 Concrete (cast in place) | 7 Aluminum, wrought iron, cast iron |
| 3 Concrete (precast) | 8 Concrete encased steel (1) |
| 4 Prestressed precast concrete (P/S) | 9 Other |
| 5 Timber | |

(1) Not gunite or shotcrete

6A27 Physical - Physical Makeup of Primary Load Carrying Members for Main Unit, Approach Unit, Sign Structure and Walls (Department)

Inventory > Agency Bridge; Form A > Structure Description; Form F

Description:

This item is used to indicate the physical makeup of the primary load carrying members (when appropriate, or subcomponents of a major bridge) for the main unit and approach unit. The physical makeup of sign structures and walls shall be coded in the main unit field only.

Procedure:

Select the code for the physical makeup of the primary load carrying members for each unit from the dropdown list. The main unit applies to all spans of most bridges, to the major unit of sizable structures or to a unit of material or design different from that of the approach spans.

For sign structures and walls, select "9 - Other" from the dropdown list.

Coding:

Primary Load Carrying Members are any bridge members that receive vehicular live load.

Secondary Members are bridge members that do not receive vehicular live load.

Subcomponent Members include all primary load carrying members that are not main members.

0	Unreinforced concrete	5	Combination, 2 to 4 above (1)
1	Reinforced	6	Rolled sections (used as stringers or main members)
2	Pretensioned	7	Rolled sections with cover plates (used as stringers or main members)
3	Post-tensioned	8	Combination, 6 and 7
4	Pre/post-tensioned	9	Other or none of the above

(1) Consider different designs within one span

*6A28 Span Interact - Type of Span Interaction for Main Unit, Approach Unit, Sign Structure and Walls (Department)

Inventory > Agency Bridge; Form A > Structure Description; Form F

Description:

This item is used to indicate whether or not there is composite action and continuity for the main unit, approach unit, sign structure and walls.

Procedure:

Select the code for the span interaction for each unit from the dropdown list. The main unit applies to all spans of most bridges, to the major unit of sizable structures or to a unit of material or design different from that of the approach spans.

For sign structures that are rigid frames, select "4 - Continuous, composite" from the dropdown list. For all other types of sign structures select "9 - Other" from the dropdown list.

For walls, select "9 - Other" from the dropdown list.

Coding:

1	Simple, non-composite	6	Continuous with hinges, non-composite
2	Simple, composite	7	Continuous with hinges, composite
3	Continuous, non-composite	8	More than one material and/or structure type
4	Continuous, composite	9	Other
5	Drop-in	A	Suspended span (contains hanger assembly)

*6A29 Struct Config - Structural Configuration Used for Main Unit, Approach Unit, Sign Structure and Walls (Department)

Inventory > Agency Bridge; Form A > Structure Description; Form F

Description:

This item is used to indicate the basic structural configuration for the main unit, approach unit, sign structure and walls.

Procedure:

Select the code for the structural configuration for each unit from the dropdown list. The main unit applies to all spans of most bridges, to the major unit of sizable structures or to a unit of material or design different from that of the approach spans.

This field also applies to sign structures, high mast lights, retaining walls and noise walls. Select the code for the structural configuration for the structure from the dropdown list.

Coding:

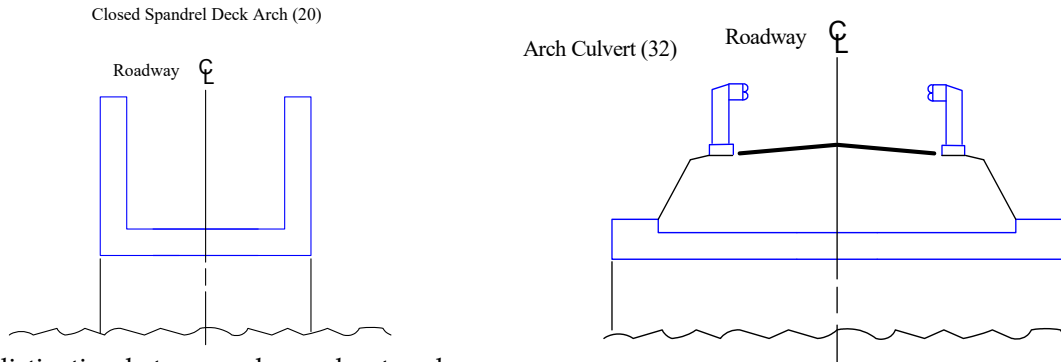
Bridges and Culverts:

BMS2	Description	BMS2	Description
01	Slab or slab beams (solid)	18	Truss - thru
02	Slab or slab beams (hollow)	19	*Arch - deck - open spandrel
03	T-beams - single or multiple (includes NEXT beams)	20	*Arch - deck - closed spandrel
04	I beams (include rolled wide flange beams with or without cover plate, prestressed concrete I beams or prestressed concrete Bulb Tee beams) - single or multiple	21	*Arch - thru
05	Box beam - single	22	Rigid Frame
06	Box beam - multiple (spread)	23	Orthotropic
07	Box beam - adjacent	24	Suspension
08	Channel beams	25	Stayed girder
09	I-welded beams - single or multiple	26	Movable - lift
10	I-riveted beams - single or multiple	27	Movable - bascule
11	Girder/floorbeam system, welded - deck	28	Movable - swing
12	Girder/floorbeam system, welded - thru	29	Tunnel
13	Girder/floorbeam system, riveted - deck	30	Frame culvert#
14	Girder/floorbeam system, riveted - thru	31	**Box culvert#
15	Girder/floorbeam system, welded with overhang bracket - deck	32	*Arch culvert#
16	Girder/floorbeam system, riveted with overhang bracket - deck	33	Tied arch culvert#
17	Truss - deck	34	Pipe culvert#
18	Truss - thru	35	Pipe - arch culvert#
		36	Solid timber beams
		37	Glue-laminated timber beams
		38	Stressed timber
		52	Segmental box girder
		99	Other

If a combination of types exist, code the most critical one.

*The preferred distinction between a closed spandrel deck arch and an arch culvert structure type is based on the fill slope's relation to the headwall. The structure should be considered a closed spandrel

deck arch when the roadway passes through the headwalls (see sketch). The structure should be considered a culvert when the headwalls are below the roadway (see sketch).



**The distinction between a box culvert and a slab bridge is based on the construction technique and is independent of the grade. A slab bridge will have a distinct break between the superstructure and the substructure, while a box culvert will be monolithic. Slab bridges and box culverts can be found at grade or under fill. A monolithic structure without a floor is a frame. As with arch structures, the distinction between a frame bridge and a frame culvert is based on the grade. Frame structures at grade are coded as bridges, while frame structures under fill are coded as culverts. The Structure Type Coding Item Comparison Chart on page 3-5 gives an overview of these coding requirement differences.

There is an important distinction between a culvert with an integral bottom and a culvert without a bottom. Culverts without a bottom must be coded as 30 or 32. These structures must also have abutments coded for structure units and piers if applicable. Culverts with an integral bottom should be coded as 31, 33, 34, or 35. They must also be coded as CIN and COU for structure units. If there is conflicting information, the SCBI calculator will return a value of a "6" and the bridge will be subjected to a 6-month inspection frequency as SCBI = 6 is considered Scour Category "A". The distinction between an arch culvert and a pipe-arch culvert is the pipe-arch culvert has a bottom. Additional information on culvert structure types are shown in FHWA's Bridge Inspection Reference Manual, Chapter 14.

Sign Structures and High Mast Lights¹:

BMS2	Description	BMS2	Description
39	Cantilever	45	Structure Mounted Sign (Old BMS code - 99)
40	2 Chord Truss	46	High Mast Light
41	3 Chord Truss	47	Pole Mounted
42	4 Chord Truss	48	Center Mounted
43	Overhead Structural Shape or Tube	49	Other
44	Overhead Truss with Multiple Spans		

¹ Refer to Publication 238, Chapter IP-02 for descriptions of sign structure types

Walls:

BMS2	Description	BMS2	Description
61	Cantilever	71	Flexible Anchored Wall
62	Counterfort	72	Concrete Modular Wall
63	Cribbing	73	Post and Panel Noise Wall
64	Gabion	74	Offset Noise Barrier
65	Mechanically Stabilized Embankment (MSE)	75	Offset Noise Barrier – Fan Wall
66	Tied Back	76	Other Wall
67	Reinforced Earth (MSE)		
68	VSL Retained Earth (MSE)		

Bridge Examples for items 6A26 to 6A29

6A26 - 6A29	Description	6A26 - 6A29	Description
21101	R.C. Slab, Simple	42107	P/S Box beam, Adjacent Simple
21301	R.C. Slab Continuous	42206	P/S Box beam, Spread, Simple, Composite
21103	R.C. T-beam, Simple	21922	R.C. Rigid Frame
21303	R.C. T-beam, Continuous	21932	R.C. Arch Culvert
16104	Steel, I beam, Simple	21931	R.C. Box Culvert
17304	Steel, I beam (cover plates), Continuous	21919	R.C. Spandrel, Open
16204	Steel, I beam Simple, Composite	21920	R.C. Spandrel, Closed (filled)
17404	Steel, I beam (cover plates), Continuous, Composite	21199	R.C. Thru Girder
42101	Prestressed Concrete Planks (solid)	69920	Masonry Spandrel, Closed (filled arch)
86204	Concrete Encased Steel I beam	59136	Timber, Solid Beam Bridge, Simple
19934	Steel Pipe Culvert under fill	59137	Timber, Glue-Laminated Beam Bridge, Simple
16411	Steel, Girder Floorbeam Stringer System, Welded Continuous, Composite Deck	21803	Concrete T-beam Bridge, Widened using P/S Concrete Beam, Simple 2
19111	Steel, Girder Floorbeam (without stringers), Simple, Welded, Deck	16112	Thru Girder w/ or w/o Sidewalk Overhangs
19117	Steel, Truss Floorbeam (without stringers), Simple, Deck		

6A30 Surf - Wearing Surface Type on Approach Spans

Inventory > Agency Bridge; Form B > Wearing Surface

Description:

This item is used to record the type of wearing surface for the approach spans of a bridge or culvert.

Procedure:

Select the type of wearing surface from the list for the approach spans.

Coding:

- | | |
|------------------------|--|
| 1 Concrete | 7 Wood or Timber |
| 2 Concrete Overlay (1) | 8 Gravel |
| 3 Latex Concrete | 9 Other |
| 4 Low Slump Concrete | 0 None (e.g., steel grid) |
| 5 Epoxy Overlay | N Not applicable (applies only to structures with no deck) |
| 6 Bituminous | |

(1) Separate layer of concrete added but not latex modified, low slump, etc.

6A31 Memb - Type of Membrane Used for Approach Spans

Inventory > Agency Bridge; Form B > Wearing Surface

Description:

This item is used to record the type of membrane used for the approach spans of a bridge or culvert.

Procedure:

Select the type of membrane from the list for the approach spans.

Coding:

- | | | | |
|---|------------------|---|--|
| 1 | Built-up | 9 | Other |
| 2 | Preformed Fabric | 0 | None |
| 3 | Epoxy | N | Not applicable (applies only to structures with no deck) |
| 8 | Unknown | | |

6A32 Protect - Type of Deck Corrosion Protection Used for Approach Spans

Inventory > Agency Bridge; Form B > Wearing Surface

Description:

This item is used to record the type of deck protection used for the approach spans of a bridge or culvert.

Procedure:

Select the type of deck corrosion protection from the list for the approach spans.

Coding:

- | | | | |
|---|---|---|--|
| 1 | Epoxy coated reinforcing | 7 | Internally sealed |
| 2 | Galvanized reinforcing | 8 | Unknown |
| 3 | Other coating reinforcing | 9 | Other |
| 4 | Cathodic protection | 0 | None |
| 5 | Dense bituminous Overlay (e.g. Rosphalt 50) | N | Not applicable (applies only to structures with no deck) |
| 6 | Polymer impregnated | S | Low corrosion steel (6A42 = 5, 6, or 7) |

6A33 Thickness - Wearing Surface Thickness for Main and Approach Units

Inventory > Agency Bridge; Form B > Wearing Surface

Description:

This item is used to record the average thickness of the wearing surface on the main and approach units of the bridge.

Procedure:

Enter the average thickness of the wearing surface for the main unit and approach units to the nearest tenth of an inch, if applicable.

Coding:

Enter the average thickness of the wearing surface to the nearest tenth of an inch, if known. Code "0" if thickness is not applicable. Code "0.5" for concrete integral wearing surface cast with the deck.

6A34 Dt Recorded - Date Wearing Surface Thickness for Main and Approach Units was Recorded

Inventory > Agency Bridge; Form B > Wearing Surface

Description:

This item is used to record the date the wearing surface thickness was recorded for the main and approach units of the bridge.

Procedure:

Enter the date the average wearing surface thickness was recorded for the main and approach units, if applicable.

Coding:

Enter the date the wearing surface thickness was recorded in MM/DD/YYYY format:

MM	2 digit month
DD	2 digit day of month
YYYY	4 digit year
00/00/0000	Not applicable

6A35 Surf Thick - Surface Thickness Over and Under

Inventory > Agency Bridge

Description:

This two part item is used to record average surface thickness over and under the membrane.

Procedure:

In the 1st field, enter the average surface thickness over the membrane to the nearest tenth of an inch, if applicable.

In the 2nd field, enter the average surface thickness under the membrane to the nearest tenth of an inch, if applicable.

Coding:

Enter the average surface thickness to the nearest tenth of an inch, if known.

6A36 Protect Year - Year Protection System was Installed

Inventory > Agency Bridge

Description:

This item indicated the year the deck protective system was installed.

Procedure:

Enter the year the protective system was installed.

Coding:

4 digit year in which the protective system was installed. Leave blank if not applicable.

6A37 Protect Note - Protection System Note

Inventory > Agency Bridge

Description:

This item is used to record descriptive information about the deck protective systems.

Procedure:

Enter available information about the deck protective systems.

***6A38 Dept Struc Typ - Bridge Deck Type**

Inventory > Agency Bridge

Description:

This item indicates the type of structural deck that is supported by the underlying load carrying members of the superstructure.

Procedure:

Select the bridge deck type code from the list.

Coding:

00	Not applicable (e.g., concrete rigid frames, slab bridges, non-composite adjacent P/S box beam bridges, culverts at grade and similar bridges without an independent deck)	13	Concrete – wax impregnated
01	Under fill (e.g., bridge structures which support a thickness of fill material which isolates the structure from the pavement carried by the structure)	14	Concrete – wire reinforced
02	Timber Plank Deck	15	Concrete – with cathodic protection
03	Spiked Laminated Timber Deck	16	Concrete filled metal (corrugated/pan.) deck
04	Glue Laminated Timber Deck	17	Bituminous/ Asphalt filled metal (corrugated/pan.) deck
05	Steel Plate	18	Plain Jack – arch
06	Steel Grid – open	19	Reinforced Jack – arch
07	Steel Grid – concrete filled or partial depth or with CIP reinforced concrete top	20	Closed Steel Plate Grid
08	Prestressed planks – full depth or prestressed plans – partial depth (with CIP reinforced concrete top)	21	Post-tensioned precast concrete slab
09	Precast reinforced concrete planks/slabs	22	Post-tensioned CIP concrete slab
10	Concrete – reinforced	23	Lightweight reinforced concrete
11	Concrete – special mix	24	Prestressed concrete planks – full depth
12	Concrete – polymer impregnated	25	Concrete – isotropic
		26	Concrete – orthotropic
		27	Concrete with calcium nitrate
		28	Concrete – flyash and cement
		29	Concrete – type K cement
		30	HPC (High Performance Concrete)
		31	Fiber Reinforced Polymer (FRP)
		32	Concrete AAAP
		99	Other

6A39 Relief Joint - Are There Pavement Relief Joints?

Inventory > Agency Bridge; Form A > Approach Roadway

Description:

This checkbox field indicates whether or not pavement relief joints are present at the bridge.

Procedure:

Check the box if pavement relief joints are present for the bridge. Uncheck the box if pavement relief joints are not present.

Coding:

Checked Pavement relief joint(s) are present
 Unchecked Pavement relief joint(s) are not present

6A40 Form Type - Type of Deck Forms Used

Inventory > Agency Bridge

Description:

This item indicates the type of deck form used on the bridge.

Procedure:

Select the code that indicates the type of deck form used on the bridge.

Coding:

1 Removable deck forms
 2 Permanent metal deck forms (Stay-In-Place forms)

6A41 No of Joints - Number of Deck Joints on Bridge

Inventory > Agency Bridge; Form A > Approach Roadway; Form B > Wearing Surface

Description:

This item is used to record the number of deck joints on the bridge.

Procedure:

Record the number of deck joints. If there are no joints on the bridge, code "0".

Note:

This item should include the number of joints on the bridge. Joints off the bridge, i.e. between the end of deck or backwall and the approach pavement/slab, are not to be included. Construction joints or longitudinal joints are not to be included.

6A42 Rebar Type - Type of Deck Reinforcement Bar Protection

Inventory > Agency Bridge

Description:

This item indicates the type of protective system used on the reinforcement bars in the concrete bridge deck.

Coding:

- 1 Bare reinforcement bars
- 2 Galvanized reinforcement bars
- 3 Epoxy coated reinforcement bars
- 4 Dual protection (i.e., combination of 2 and 3)
- 5 Stainless Steel Clad Rebars
- 6 MMFX Steel
- 7 Stainless Steel (Solid)
- 9 Other

6A43 Appr Pav Width - Width of Pavement on the Approach to the Bridge

Inventory > Agency Bridge; Form A > Approach Roadway

Description:

This item is used to record the width of the pavement on the roadway approaching the bridge.

Procedure:

The width is measured normal to the centerline of the roadway approaching the structure. This dimension will not include the widths of the outer shoulders. When there is a variation between the approaches at either end of the structure, determine the approach pavement width using the most hazardous of the approach conditions. For closed median bridges, the width of the approach pavement should include the median (1). For a dirt road, code "000".

- (1) Only when the approach roadway median meets the definition for a shoulder (see Item 5C26).

Example

Left Shoulder	Left Roadway	Median	Right Roadway	Right Shoulder	Code
4.0	---	---	16	6.0	016
6.0	---	---	36	12.0	036
12.0	48	30	48	12.0	126
10.0	24	16	36	10.0	076

The information recorded in this item must be compatible with the "Approach Roadway Width" coded in item 5C26.

For "Left" and "Right", etc., designations, refer to the Definitions Section of this manual.

For paved shoulder approaches with no painted stripes, measure to grade breaks if present, otherwise, use full width and notify the Bridge Inspection Supervisor. The Approach Roadway Width will then be:

- 1 The roadway width from the automated Straight Line Diagram (SLD) in RMS.
- 2 The smaller of (11' or 12') times the number of traffic lanes or the entire roadway width.

6A44 Group No - Fracture Critical Group Number for Main Unit and Approach Spans

Inventory > Agency Bridge; Form F

Description:

This item is used to record the bridge Group Number.

Procedure:

Select the bridge group number from the dropdown list. If the bridge meets criteria listed in more than one group, enter the lowest group number.

Coding:

Group	Structure Type	FCM/Component/Detail
1	One Girder Bridge	Entire Girder, Tension Zone
	Two Girder Bridge	
	with Simple Span	Girder, Tension Zone
	with Suspended Span	Suspended Hanger Assembly plus Girder Tension Zone
	Truss Bridge	
	with Simple Span	Tension Member (including Eye Bar if 2 or less)
	with Suspended Span	Suspended Hanger Assembly plus Tension Members and Certain Diagonals
	Tied Arch	Tension Tie
	Cross-Girder Pier Cap	Tension Zone
	Suspension Bridges	Eye Bar (2 or less) Chain or Cables
2	Two Girder Continuous	End Span Girder, Tension Zone
	Truss, Continuous	Tension Member (including Eye Bar if 2 or less)
	Rigid Frame Steel Pier	Tension Zone
3	Two Girder Continuous	Interior Span Girder, Tension Zone
4	Three Girder Bridges	Not highly fracture critical, but consideration should be given to inspect
	with Simple Span	Girder, Tension Zone
	with Continuous Span	Girder, Tension Zone
	with Suspended Span	Suspended Hanger Assembly plus Girder Tension Zone
5	Four or more Girder Bridges	None
	Welded/Riveted/ Bolted	
	Built-up Sections	
	Rolled Beam with Welded Partial/Full Cover Plate	
6	Multi-Stringer Rolled Beam Bridges (No welding except welding may be used for transverse diaphragm connection)	None
7 & 8	Reserved - Do Not Use	
9	All other Non-Steel Bridges (Concrete, P/S Concrete, Timber, P.P. Culverts, etc.)	

Note:

Shading indicates non-Fracture Critical bridge types

Refer to Pub. 238, Chapter IP-02, Classification of Fracture Critical Members, for further information on coding items 6A44-6A48.

6A45 Mem Type - Critical Ranking Factor Type of Member for Main Unit and Approach Spans

Inventory > Agency Bridge; Form F

Description:

This item is used to record the bridge Type of Member component of the Critical Ranking Factor.

Procedure:

Select the bridge type of member from the dropdown list. If more than 1 CRF applies, use the lowest value. For additional information on this coding, refer to Pub. 238, Chapter IP-02.

Coding:

- | | | | |
|---|------------------------|---|---|
| 0 | Suspended assembly | 3 | Riveted/bolted rolled sections with tack welding welded connection plates |
| 1 | Intersecting welds | 4 | Riveted/bolted rolled section no welding |
| 1 | Welded, direct tension | 9 | Non-steel bridges |
| 2 | Welded, bending | | |

6A46 Fatig Sus - Critical Ranking Factor Fatigue Susceptibility for Main Unit and Approach Spans

Inventory > Agency Bridge; Form F

Description:

This item is used to record the bridge Fatigue Crack Susceptibility component of the Critical Ranking Factor.

Procedure:

Select the bridge fatigue susceptibility factor from the dropdown list. If more than 1 CRF applies, use the lowest value. For additional information on this coding, refer to Pub. 238, Chapter IP-02.

Coding:

Type	Code (2)	
Intersecting Welds	0	
Suspended Assembly	0	
	AASHTO	
	<u>Stress Category</u>	<u>Code</u>
Welded, Direct Tension	E' (1)	1
	E	2
Welded, Bending	D	3
Riveted/Bolted Rolled Sections	C & C'	4
Tack Welding	B & B'	5
Welded Connection Plates	A	6
Riveted/Bolted Rolled Sections No Welding	Out of Plane Bending Detail code 1, else code 8	
Non-Steel Bridges	9	

(1) Includes Out of Plane Bending Details

(2) Fatigue crack susceptibility is not dependent upon AASHTO stress category detail alone but also upon the actual stress range.

6A47 Material - Critical Ranking Factor Material for Main Unit and Approach Spans

Inventory > Agency Bridge; Form F

Description:

This item is used to record the bridge Material component of the Critical Ranking Factor.

Procedure:

Select the bridge material factor from the dropdown list. If more than 1 CRF applies, use the lowest value. For additional information on this coding, refer to Pub. 238, Chapter IP-02.

Coding:

Type	Code		
Intersecting Welds	0		
Suspended Assembly	0		
Welded, Direct Tension	Weldable	CVN	
	Steel	At	
	<u>Grade</u>	<u>+40°F</u>	<u>Code</u>
	No	<15	1
Welded, Bending	No	>15	2
	Yes	<15	3
Riveted/Bolted Rolled Sections Tack Welding	Yes	>15	4
	* If CVN not known, assume <15		
Riveted/Bolted Rolled Sections No Welding	8		
Non-Steel Bridges	9		

6A48 ADTT - Critical Ranking Factor Cumulative Truck Traffic for Main Unit and Approach Spans

Inventory > Agency Bridge; Form F

Description:

This item is used to record the bridge Cumulative Truck Traffic component of the Critical Ranking Factor.

Procedure:

Select the bridge cumulative truck traffic factor from the dropdown list. If more than 1 CRF applies, use the lowest value. For additional information on this coding, refer to Pub. 238, Chapter IP-02.

Coding:

Type of Member	Cumulative Truck Traffic	
Intersecting Welds	1	
Suspended Assembly	<u>ADTT</u>	<u>Code</u>
Welded, Direct Tension	High >2000	1
	Medium	2
	Low <1000	3
Welded, Bending	Use estimated remaining fatigue life to approximate the effect of cumulative truck traffic	
Riveted/Bolted Rolled Sections Tack Welding Welded Connection Plates	<u>Remaining Fatigue Life</u>	<u>Code</u>
Riveted/Bolted Rolled Sections No Welding	< 10 Years	1
	11-20 Years	2
Non-Steel Bridges ⁽¹⁾	> 20 Years	3

(1) Unless a fatigue analysis indicates a problem, a coding of "3" is appropriate for non-steel bridges.

6A49 Total CRF - Total FCM Critical Ranking Factor for Main Unit or Approach Spans

Inventory > Agency Bridge; Form F

Description:

This display only item is used to record the sum of the Main Fracture Critical Ranking Factor or the Approach Fracture Critical Ranking Factor. This information is automatically calculated by adding the 4 numeric values of the FCM Critical Ranking Factor values.

Procedure:

The system automatically adds the data from 6A45, 6A46, 6A47, and 6A48 to obtain a Main FCM CRF total or the Approach FCM CRF.

Coding:

The 2 digit sum relating to the Main FCM CRF total or the Approach FCM CRF.

6A50 Superstructure - Do Plug Welds exist on Bridge Superstructure?

Inventory > Agency Bridge; Form A > Vertical Clearance

Description:

This item indicates if there are plug welds present on the bridge superstructure.

Procedure:

This item should be coded by District personnel based on documented information indicating plug welds exist on one or more of the bridge superstructure members. This field is used to indicate the existence of the plug welds, if applicable. Detailed notes about the plug welds should be entered in

iForms or BMS2 in the superstructure notes and comments as well as Fracture Critical fields, IF01 through IF06 if the plug welds exist on a fracture critical member.

Coding:

- 0 - No Plug Welds Identified
- 1 - Plug Weld(s) on FCM
- 2 - Plug Weld(s) on NonFCM

6A51 Substructure - Do Plug Welds exist on Bridge Substructure?

Inventory > Agency Bridge; Form A > Vertical Clearance

Description:

This item indicates if there are plug welds present on the bridge substructure.

Procedure:

This item should be coded by District personnel based on documented information indicating plug welds exist on one or more of the bridge substructures units. This field is used to indicate the existence of the plug welds, if applicable. Detailed notes about the plug welds should be entered in iForms or BMS2 in the substructure notes and comments as well as Fracture Critical fields, IF01 through IF06 if the plug welds exist on a fracture critical member.

Coding:

- 0 - No Plug Welds Identified
- 1 - Plug Weld(s) on FCM
- 2 - Plug Weld(s) on NonFCM

6A52 Traffic - Estimated Cumulative Truck Traffic in Thousands

Inventory > Agency Bridge

Description:

This item is used to record the estimated cumulative truck traffic being carried by the structure.
This item is for future use.

6A53 Fatig Life - Estimated Cumulative Truck Traffic for Fatigue Damage

Inventory > Agency Bridge

Description:

This item is used to record the estimate of the cumulative truck traffic that will result in the initiation of fatigue damage on the most fatigue prone member of the bridge.

Procedure:

Enter an estimate of the cumulative truck traffic that will result in the initiation of fatigue damage, in thousands of trucks.

Coding:

The number of trucks, in thousands.

6A54 Year - Month and Year of Estimated Cumulative Truck Traffic

Inventory > Agency Bridge

Description:

This item is used to record the month and year of the estimated cumulative truck traffic.
This item is for future use.

6A55 Deck Recon - Proposed Major Deck Reconstruction

Inventory > Agency Bridge

Description:

This item is used to record the type of proposed major reconstruction to be performed for the deck.

Procedure:

Enter the appropriate type of major reconstruction for the deck.

Coding:

Code using the deck type reconstruction from the table in 3B01.

6A56 Super Recon - Proposed Major Superstructure Reconstruction

Inventory > Agency Bridge

Description:

This item is used to record the type of proposed major reconstruction to be performed for the superstructure.

Procedure:

Enter the appropriate type of major reconstruction for the superstructure.

Coding:

Code using the superstructure type reconstruction from the table in 3B01.

6A57 Sub Recon - Proposed Major Substructure Reconstruction

Inventory > Agency Bridge

Description:

This item is used to record the type of proposed major reconstruction to be performed for the substructure.

Procedure:

Enter the appropriate type of major reconstruction for the substructure.

Coding:

Code using the substructure type reconstruction from the table in 3B02

6A58 Context Pres – Contextual Preservation

Inventory > Agency Bridge

Description:

This item is used to record a bridge that merits contextual preservation in Bucks or Chester counties.

Procedure:

The Contextual Bridge Preservation Task Force established a protocol for addressing contextual preservation of bridges in Bucks and Chester Counties in District 6-0. A bridge that merits contextual preservation is defined as a bridge that has important community values reflective of the context the bridge plays in community life, including symbolic, social, and recreational. Examples might include a bridge representing a gateway into a community, or, a bridge that is the focus of an annual festival. Contextual Preservation is distinct from Historic Preservation, which is assessed through application of criteria of the National Register of Historic Places.

Local bridge owners are responsible for assessing the community context and determining whether the bridge has important community value. The assessment of state owned bridges located in Bucks and Chester Counties shall be determined by District 6-0 following guidelines specified by the District.

Coding:

Unchecked	Structure does not meet the criteria
Checked	Structure meets the criteria

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6B Agency - Inspection

The Agency Inspection screen is used to enter agency-specific information associated with the inspection of a bridge.

6B01 Spc Insp Type - Type of Special Inspection That Is Needed

Inspection > Agency Inspection; Form P > Next Inspection

Description:

This item is used to record the type of special inspection that is needed before the next bridge inspection. This coding is for tracking certain equipment and manpower requirements and is not applicable to 7A03 inspection type coding.

Procedure:

Select the code that describes the type of special inspection that is needed.

Coding:

- 4 Problem areas only (existing and/or potential)
- 5 Special areas only - management directed
- 6 Personnel lift only
- 7 Inspection crane only
- 8 Rigging only
- 9 Underwater only
- Blank Special inspection not needed at this time

6B02 New Wear Srf Ind - New Wearing Surface Under the Bridge Indicator

Inspection > Agency Inspection; Form A > Approach Roadway

Description:

This checkbox field indicates whether or not the wearing surface underneath the bridge is new.

Procedure:

Check the box if the wearing surface is new since the previous inspection.

Coding:

- Unchecked The wearing surface is not new since the previous inspection
- Checked The wearing surface is new since the previous inspection

6B03 Inventory Correction Ind - Inventory Correction Indicator

Inspection > Agency Inspection; Form P > Current Inspection

Description:

This checkbox field indicates whether or not the inspector recommends that inventory item(s) should be reviewed and corrected.

Procedure:

Check the box if any inventory correction has been recommended during the inspection.

Coding:

Unchecked Inventory corrections have not been recommended
 Checked Inventory corrections have been recommended

6B04 Bump at Bridge Ind - Bump at Bridge Indicator

Inspection > Agency Inspection; Form A > Approach Roadway

Description:

This checkbox field indicates whether or not there is a bump at the bridge.

Procedure:

Check the box if there is a bump at the bridge.

Coding:

Unchecked There is not a bump at the bridge
 Checked There is a bump at the bridge

6B05 Deck Overlay Meas Dt - Deck Overlay Measurement Date 

Inspection > Agency Inspection

Description:

This item is used to record the date on which the deck overlay thickness was measured.

Procedure:

Enter the date on which the deck overlay thickness was measured.

Coding:

Date on which the deck overlay thickness was measured in MM/DD/YYYY format:

MM 2 digit month
 DD 2 digit day of month
 YYYY 4 digit year
 00/00/0000 Not applicable

6B06 Utility Repair Ind - Utility Repair Required

Inspection > Agency Inspection

Description:

This checkbox field is used to indicate whether or not the utility present on the structure needs any repair.

Procedure:

Check the box to indicate that the utility present on the structure needs to be repaired. This box should always be unchecked if utilities are not present on the structure.

Coding:

Unchecked Utilities do not need repair or do not exist
 Checked Utilities need repair

6B07 Est. Spall Delam % - Estimated Spall or Delamination Percent

Inspection > Agency Inspection; Form B > Deck & Superstructure

Description:

This item is used to record the estimated percentage of spalled or delaminated area of the top deck surface.

Procedure:

Enter the estimated percentage of spalled or delaminated area of the top of deck surface to the nearest percent.

Coding:

Estimated percentage of spalled or delaminated area of the deck surface to the nearest percent.

6B08 Est. Spall Delam Dt - Estimated Spall or Delamination Percent Date 

Inspection > Agency Inspection; Form B > Deck & Superstructure

Description:

This item is used to record the date on which the spalled or delaminated area percentage was estimated.

Procedure:

Enter the date on which the spalled or delaminated area percentage was estimated.

Coding:

Date on which the spalled or delaminated area percentage was estimated in MM/DD/YYYY format:

MM	2 digit month
DD	2 digit day of month
YYYY	4 digit year
00/00/0000	Not applicable

6B09 Weather - Weather Condition

Inspection > Agency Inspection; Form P > Current Inspection

Description:

This item is used to record the weather condition during the inspection.

Procedure:

Select the code from the dropdown list that most accurately describes the weather condition during the inspection.

Coding:

1	Clear
2	Partly Cloudy
3	Cloudy
4	Overcast
5	Snow
6	Rain

6B10 Est. Spall Chloride % - Estimated Chloride Content Percent

Inspection > Agency Inspection; Form B > Deck & Superstructure

Description:

This item is used to record the estimated percentage of chloride content in the deck.

Procedure:

Enter the estimated percentage of chloride content in the deck to the nearest percent.

Coding:

Estimated percentage of chloride content in the deck to the nearest percent.

6B11 Est. Spall Chloride Dt - Estimated Chloride Content Date

Inspection > Agency Inspection; Form B > Deck & Superstructure

Description:

This item is used to record the date on which the chloride content was estimated.

Procedure:

Enter the date on which the chloride content was estimated.

Coding:

Date on which the chloride content was estimated in MM/DD/YYYY format:

- MM 2 digit month
- DD 2 digit day of month
- YYYY 4 digit year
- 00/00/0000 Not applicable

6B12 Temperature

Inspection > Agency Inspection; Form P > Current Inspection

Description:

This item is used to record the atmospheric temperature during the inspection.

Procedure:

Enter the atmospheric temperature in degrees Fahrenheit (°F).

Coding:

The atmospheric temperature in degrees Fahrenheit (°F).

6B13 Under Cont Vert - Underclearance Controlling Vertical

Inspection > Agency Inspection; Form A > Vertical Clearance

Description:

This item indicates the controlling vertical underclearance used in the underclearance appraisal (Item 4A11).

Procedure:

Enter the controlling vertical underclearance to the nearest tenth of a foot. This value will typically be the lesser value from 6C20 and 6C21 unless field measurements indicate a change in the vertical underclearance data.

Coding:

Controlling vertical underclearance to the nearest tenth of a foot.

6B14 Deck Geom Appr Tbl - Table Used for Deck Geometry Appraisal

Inspection > Agency Inspection; Form A > Vertical Clearance

Description:

This item indicates the table used to determine the deck geometry appraisal.

Procedure:

Select the table used to determine the deck geometry appraisal from the dropdown list.

Coding:

Table 2A/2B
Table 2C/2D
Table 2E

6B15 (Not Used – Reserved for Future Use)

Items 6B16 to 6B18 are to be entered only if Item 4A09 utilized Table 1 for the Structural Evaluation. See Item 4A09 for Table 1.

6B16 Appr Based On - Appraisal Based On

Inspection > Agency Inspection

Description:

This item is used to indicate if Table 1 controls the code for Item 4A09.

Procedure:

Select the appropriate code from the dropdown list to indicate if Table 1 was used.

Coding:

0 Table 1 does not control the code for Item 4A09.
1 Table 1 controls the code for Item 4A09.

6B17 ADT - Average Daily Traffic

Inspection > Agency Inspection; Form A > Vertical Clearance

Description:

This item is used to record the “current” average annual daily traffic volume.

Procedure:

Enter the ADT that was used to calculate the Structural Evaluation rating for Item 4A09. If this information is not available, a best estimate is recommended.

Coding:

Number of vehicles per day.

6B18 Inventory Rating

Inspection > Agency Inspection

Description:

This item is used to record the inventory rating used to calculate the Structural Evaluation rating for Item 4A09. The HS inventory rating should be recorded.

Procedure:

Enter the HS Inventory rating or equivalent used to calculate the Structural Evaluation rating for Item 4A09.

Coding:

Inventory Rating in tons.

6B19 Cap Appr Cntrl - Capacity Appraisal Control

Inspection > Agency Inspection

Description:

This item is used to indicate what the load type controls the capacity appraisal.

Procedure:

Select the appropriate code from the dropdown list to indicate the load type used for 4B03.

Coding:

- 1 H Load
- 2 HS Load
- 3 ML80 Load
- 4 TK527
- 5 Engineering Judgment

6B20 Insp Type - Next Inspection Type

Inspection > Agency Inspection; Form P > Next Inspection

Description:

This item is used to indicate the next inspection type required for the structure.

Procedure:

Refer to Item 7A03 for inspection type description and coding. Select the type of inspection required next for the structure from the dropdown list.

6B21 Crane Insp Dt - Crane Inspection Date

Inspection > Agency Inspection

Description:

This item is used to record the date of the next inspection that requires a crane.

Procedure:

Enter the date of the next inspection that requires a crane.

Coding:

Date of the next inspection that requires a crane in MM/DD/YYYY format:

MM	2 digit month
DD	2 digit day of month
YYYY	4 digit year
01/01/1901	Not applicable

6B22 (Not Used – Reserved for Future Use)**6B23 Member - Team Helper**

Inspection > Agency Inspection; Form P > Next Inspection

Description:

This narrative item is used to record the name(s) of the team helper(s) that inspected the bridge.

Procedure:

Enter the name(s) of the team helper(s) in narrative form.

Coding:

Name(s) of the team helper(s) in narrative form.

6B24 Hired By - Agency that Hired the Consultant

Inspection > Agency Inspection; Form P > Next Inspection

Description:

This item indicates which agency hired the consultant to inspect the bridge.

Procedure:

This item should be completed only if the bridge was inspected by a consultant. In this case, data item 7A05, Inspection Performed By, should be coded "8" (consultant firm). Enter the code that describes the agency which hired the consultant.

Coding:

1	Pennsylvania Department of Transportation	5	Delaware River Joint Toll Bridge Commission
2	County	6	Other State Agency
3	City, Borough or Township	7	Railroad
4	Pennsylvania Turnpike Commission	8	Other

6B25 Insp Contract Num - Inspection Contract Number

Inspection > Agency Inspection; Form P > Next Inspection

Description:

This item is used to record the inspection agreement contract number.

Procedure:

Enter the inspection agreement contract number.

Coding:

Inspection agreement contract number.

Example: E09999

6B26 NBI Crew - NBI Crew Hours (Actual)

Inspection > Agency Inspection; Form P > Next Inspection

Description:

This item is used to record the number of actual crew hours taken to complete a regular NBI inspection of the structure.

Procedure:

Enter the number of actual crew hours taken to complete a regular NBI inspection of the structure to the nearest hour.

Coding:

The number of hours, to the nearest hour.

6B27 Crane - Crane Hours (Actual)

Inspection > Agency Inspection; Form P > Next Inspection

Description:

This item is used to record the number of actual crane hours taken to complete a regular NBI inspection of the structure.

Procedure:

Enter the number of actual crane hours taken to complete a regular NBI inspection of the structure to the nearest hour. Include travel time required, not counting time lost due to weather or breakdown. If a crane was not used, leave blank.

Coding:

The number of hours, to the nearest hour.

6B28 Frac Crit - Fracture Critical Hours (Actual)

Inspection > Agency Inspection; Form P > Next Inspection

Description:

This item is used to record the number of actual hours taken to complete a fracture critical inspection of the structure.

Procedure:

Enter the number of actual hours taken to complete a fracture critical inspection of the structure to the nearest hour.

Coding:

The number of hours, to the nearest hour.

6B29 Other 1

Inspection > Agency Inspection; Form P > Next Inspection

Description:

Not currently used

6B30 UWater - Underwater Hours (Actual)

Inspection > Agency Inspection; Form P > Next Inspection

Description:

This item is used to record the number of actual hours taken to complete an underwater inspection of the structure.

Procedure:

Enter the number of actual hours taken to complete an underwater inspection of the structure to the nearest hour.

Coding:

The number of hours, to the nearest hour.

6B31 Other 2

Inspection > Agency Inspection; Form P > Next Inspection

Description:

Not currently used.

6B32 Engineer - Inspection Engineering Cost

Inspection > Agency Inspection; Form P > Next Inspection

Description:

This item is used to record the engineering cost expended for the inspection of the bridge. This data is also used to re-coup local share of inspection costs in accordance with Act 44 of 1988.

Procedure:

This item should be completed only if the bridge was inspected by a consultant. In this case, item 7A05, Inspected By, should be coded "8".

Enter the costs for the field inspection of the bridge.

Coding:

The inspection engineering costs, in dollars.

Example:

The engineering inspection cost is \$354,909.57.

Code 354910

6B33 Rigging - Inspection Rigging Cost

Inspection > Agency Inspection; Form P > Next Inspection

Description:

This item is used to record the rigging cost expended for the inspection of the bridge. This data is also used to re-coup local share of inspection costs in accordance with Act 44 of 1988.

Procedure:

This item should be completed only if the bridge was inspected by a consultant. In this case, item 7A05, Inspected By, should be coded "8".

Enter the costs for rigging the bridge for inspection. If no rigging was required, leave this item blank.

Coding:

The inspection rigging costs in dollars.

6B34 Office - Inspection Office Cost

Inspection > Agency Inspection; Form P > Next Inspection

Description:

This item is used to record the office work cost associated with the inspection of the bridge. This data is also used to re-coup local share of inspection costs in accordance with Act 44 of 1988.

Procedure:

This item should be completed only if the bridge was inspected by a consultant. In this case, item 7A05, Inspected By, should be coded "8".

Enter the costs for the office work associated with the inspection.

Coding:

The inspection office costs in dollars.

6B35 New Paint Since Last Insp - New Paint Since Last Inspection

Inspection > Agency Inspection; Form K > Paint

Description:

This checkbox field is used to indicate if the paint is new since the previous inspection.

Procedure:

Check the box if new paint has been applied to the structure since the last inspection.

Coding:

Unchecked New paint has not been applied to the structure since the last inspection
 Checked New paint has been applied to the structure since the last inspection

6B36 Paint - Paint Condition Rating

Inspection > Agency Inspection; Form K > Paint

Description:

This item indicates the condition of the paint on the bridge.

Procedure:

Select the code from the dropdown list which indicates the condition of the bridge paint. This item is applicable to steel bridges only. The purpose of this item is to establish need and priority for painting steel structures.

Note:

Encased I-beams with exposed bottom flanges should be coded.

Coding:

- N Not Applicable
- 9 New Condition
- 8 Good – That condition of the paint system where there may be minor spots of deterioration or cracking with virtually all of the paint system intact and not peeling. A few minor rust spots are acceptable.
- 7 Fair to Good – Conditions that fall between code 8 and code 6.
- 6 Fair – That condition of the paint system where a number of small rust areas or blisters may be noted and/or there may be loose rust formation pitting/peeling of the paint.
- 5 Poor to Fair – Conditions that fall between code 6 and code 4.
- 4 Poor – That condition of the paint system where the system has broken down and there may be major areas of peeling and cracking along with a high percentage of severely rusted areas with scales and/or flakes (need for painting is urgent).
- 3 Critical to Poor – That condition of the paint that caused the metal to corrode to such an extent of deep pitting and loss of section in non-critical areas and where the loss of section is considered to be minor.
- 2 Critical – The condition of the paint that caused corrosion of metal to such an extent that there is major loss of section and deep pitting on a large percentage of the area of the element or the loss of section which has materially affected the strength of the member and requires immediate correction.
- 1 Intolerable – Study should determine the feasibility for repair and merit of painting.
- 0 Painting will no longer help – Structure is generally in a hopeless condition

Summary Paint Condition Rating Codes

<u>Coding</u>	<u>Indication</u>
8, 7	Spot painting
6, 5	Program for painting
4	Urgently in need of painting
3, 2	Structure repair may be required before painting
1, 0	Beyond repair (painting is a waste of resources)

6B37 Paint (Extent) - Extent of the Paint Condition

Inspection > Agency Inspection; Form K > Paint

Description:

The field indicates the extent of the paint condition described in item 6B36.

Procedure:

Select the most applicable code from the dropdown list to indicate the extent of the paint condition described in item 6B36. Applicable to steel bridges only.

The purpose of this item is to establish need and priority for painting steel structures.

Note:

Encased I-beams with exposed bottom flanges should be coded.

Coding:

N	Not Applicable
9	Painting needed near deck joints only
8	Minor spot painting of finish coat needed
7	Moderate spot painting of finish coat needed
6	Spot painting plus 1 to 60% of finish coat needs to be painted
5	Spot painting plus greater than 60% of finish coat needs to be painted
4	Blast cleaning and painting needed for a zone which is about 20% to 40% of the steel
3	Blast cleaning and painting needed for a zone which is about 40% to 60% of the steel
2	Blast cleaning and painting needed for a zone which is greater than 60% of the steel surface area
1	Blast cleaning and painting of the entire bridge is needed
0	Reserved

Condition Rating Codes Used For the Following Fields

In order to promote uniformity between inspectors, these guidelines will be used to rate and code items 6B38, 6B39, and 6B40, as well as items 1A01, 1A02, 1A03, 1A04, and 1A05.

Condition ratings are used to describe the existing in-place structure as compared to the as-built condition.

Condition codes are properly used when they provide an overall characterization of the general condition of the entire component being rated.

Conversely, they are improperly used if they attempt to describe localized or nominally occurring instances of deterioration or disrepair. Correct assignment of a condition code must, therefore, consider both the severity of the deterioration or disrepair and the extent to which it is widespread throughout the component being rated.

The load carrying capacity will not be used in evaluating condition items. The fact that a bridge was designed for less than the current legal loads and may be posted shall have no influence upon condition ratings.

Portions of the bridges that are being supported or strengthened by temporary members will be rated based on their actual condition; that is, the temporary members are not considered in the rating of the item. (See item 5E03, Temporary Structure Designation, for the definition of a temporary bridge).

Completed bridges not yet open to traffic, if rated, shall be coded as if open to traffic. Even if the bridge is closed, rate each item without being influenced to the fact that the bridge is closed.

The determination of which of the following ratings apply to each of the items will be based on an evaluation of all the relevant factors and information included in the detailed inspection reports. The rating chosen for each of these items will, in effect, be a composite of all of the relevant factors.

It should be recognized that this will require judgment, particularly for those items where the ratings seem not to apply. There are unique situations, but again, it is expected that some judgment will be used.

Rating Codes

- N **Not Applicable**
- 9 **Excellent Condition**
- 8 **Very Good Condition** – no problems noted
- 7 **Good Condition** – some minor problems
- 6 **Satisfactory Condition** – structure elements show some minor deterioration
- 5 **Fair Condition** – all primary structure elements are sound but may have minor section loss, cracking, spalling or scour
- 4 **Poor Condition** – advanced section loss, deterioration, spalling or scour
- 3 **Serious Condition** – loss of section, deterioration, spalling or scour may have seriously affected primary structural components. Local failures are possible. Fatigue cracks in steel or shear cracks in concrete may be present.
- 2 **Critical Condition** – advanced deterioration of primary structural elements. Fatigue cracks in steel or shear cracks in concrete may be present or scour may have removed substructure support. Unless closely monitored, it may be necessary to close the bridge until corrective action is taken.
- 1 **“Imminent” Failure Condition** – major deterioration or section loss present in critical structural components or obvious vertical or horizontal movement affecting structure stability. Bridge is closed to traffic but corrective action may put back in light service.
- 0 **Failed Condition** – out of service – beyond corrective action.

Reference: FHWA’s Recording and Coding Guide for the Structural Inventory and Appraisal of the Nation’s Bridges <http://www.fhwa.dot.gov/bridge/mtguide.pdf>

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6B38 Appr Slab - Approach Slab

Inspection > Agency Inspection; Form A > Approach Roadway

Description:

This item indicates the condition of the approach slab and the pavement relief joints of the bridge, if any.

Procedure:

Select the code from the dropdown list which indicates the condition of the reinforced concrete approach slab and the pavement relief joints. (Approach roadway, which includes the approach slab should be rated in item 6B39).

Coding:

Refer to **RATING CODES**. If no reinforced concrete approach slab is present (current Department Standard Drawings or previous standards), code "N".

6B39 Appr Roadway - Approach Roadway Condition Rating

Inspection > Agency Inspection; Form A > Approach Roadway

Description:

This item indicates the condition of the approach roadway including bridge approach slab where present.

Procedure:

Select the code from the dropdown list which indicates the condition of the approach roadway in relation to its effect on the use of the bridge. In assigning the rating, consideration should be given to the condition of the bridge approach slab, if any, shoulders and factors such as settlement, drainage, misalignment and/or heave, potholes, etc., and conditions which could lead to loss of vehicle control with possible impact with components of the structure.

Coding:

Refer to **RATING CODES**.

Code "N" for structures under fill.

Guiderails, etc., are not included in the assessment of approach roadway codings. They are coded in item IA02.

6B40 Deck Wear Surf - Deck Wearing Surface Condition Rating

Inspection > Agency Inspection; Form B > Wearing Surface

Description:

This item is used to record the condition rating of the wearing surface on the bridge deck.

Procedure:

Select the code from the dropdown list which indicates the condition of the deck wearing surface on the structure.

Coding:

Refer to **RATING CODES**. Concrete or asphaltic material overlayment on grid floor decks requires coding.

Code "N" for structures under fill, or where not applicable (e.g. steel grid floor deck, timber deck without wearing surface overlayment).

Note:

For additional information about rating P/S adjacent box beam concrete deck covered by wearing surface, refer to Pub. 238, Section IE 3.8.4.

6B41 Fund Rehab Elig - Eligibility of Bridge FCB Funds

Inspection > Agency Inspection

Description:

This item indicates the eligibility of the bridge for federal critical bridge (FCB) funds for rehabilitation or replacement.

Procedure:

Computed and entered automatically by the system.

If the Sufficiency Rating (SR) is less than 50.0 and the structure is structurally deficient or functionally obsolete, the structure is eligible for FCB funds for rehabilitation or replacement.

If the SR is greater than or equal to 50.0 but less than or equal to 80.0 and the structure is structurally deficient or functionally obsolete, it is eligible for FCB funds for rehabilitation only.

Coding:

- P Meets FHWA replacement criteria
- H Meets FHWA rehabilitation criteria

6B42 S1 - Structural Adequacy and Safety Component

Inspection > Agency Inspection

Description:

This item is used to indicate the structural adequacy and safety component of the Sufficiency Rating of the structure.

Procedure:

Computed and entered automatically by the system based on the following data items: Inventory Rating Load and the condition ratings for the superstructure, substructure and culvert. Refer to FHWA's SI&A Recording and Coding Guide for the formulates that define S1.

Coding:

A specific number, to the nearest tenth, computed by the system.

Range: 0.0 - 55.0

6B43 S2 – Serviceability and Functional Obsolescence Component

Inspection > Agency Inspection

Description:

This item is used to indicate the serviceability and functional obsolescence component of the Sufficiency Rating.

Procedure:

Computed and entered automatically by the system. Refer to FHWA's SI&A Recording and Coding Guide for the numerous formulas that are used in computing this item. Refer to FHWA's SI&A Recording and Coding Guide for the formulates that define S2.

Coding:

A specific number, to the nearest tenth, computed by the system.

Range: 0.0 - 30.0

6B44 S3 – Essentiality for Public Use Component

Inspection > Agency Inspection

Description:

This item is used to indicate the essentiality for public use component of the Sufficiency Rating of the structure.

Procedure:

Computed and entered automatically by the system. Refer to FHWA's SI&A Recording and Coding Guide for the numerous formulas that are used in computing this item. Refer to FHWA's SI&A Recording and Coding Guide for the formulates that define S3.

Coding:

A specific number, to the nearest tenth, computed by the system.

Range: 0.0 - 15.0

6B45 S4 – Special Reductions Component

Inspection > Agency Inspection

Description:

This item is used to indicate the special reductions component of the Sufficiency Rating.

Procedure:

Computed and entered automatically by the system. Refer to FHWA's SI&A Recording and Coding Guide for the numerous formulas that are used in computing this item. Refer to FHWA's SI&A Recording and Coding Guide for the formulates that define S4.

Coding:

A specific number, to the nearest tenth, computed by the system.

Range: 0.0 - 13.0

6B46 Deficiency Rating - Total Maintenance Deficiency Points Assigned to the Bridge

Inspection > Agency Inspection

Description:

This item indicates the total maintenance deficiency points assigned to the bridge.

Procedure:

Computed and entered automatically by the system when the inspection is approved. This item is based on user input of bridge maintenance activities and their urgencies. Factors considered by the system include: ADT, Detour Length, Network, Kind of Highway, Inventory Load Capacity and Condition Ratings of the bridge components.

Coding:

A specific number, to the nearest tenth, computed by the system:

- 100.0 Highest priority for maintenance work
- 0.0 No maintenance deficiency

6B47 Deck Cracking - Deck Cracking Metric

Inspection > Agency Inspection

Description:

This item is used to indicate the total length of deck cracks per total deck area (yards per square yards).

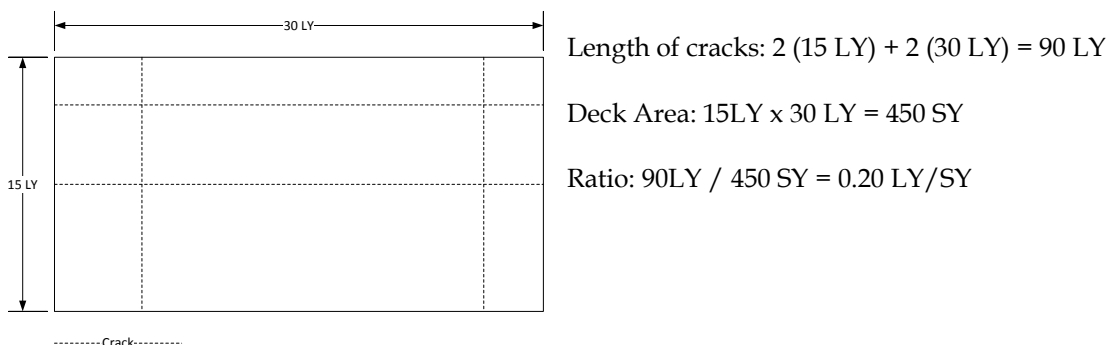
Procedure:

Determine the total length of transverse and longitudinal deck cracking in yards. Divide the total length of cracks in yards by the total deck area in square yards to calculate a ratio of yards per square yard. This field should only be coded for bridges with a bare concrete deck (5B02 = 1 - Concrete). If the deck is covered in map cracking, code this field as 1.00. This measurement is designed to be quickly calculated with rough estimates.

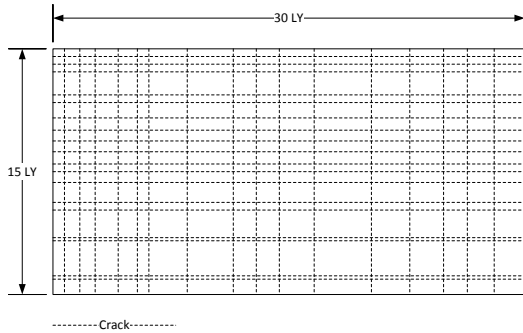
Coding:

Enter a value between 0.00 and 1.00.

Examples:



(example continued on the next page)



Ratio: 1.00 LY/SY

- Extensive cracking, code as 1.00. Do not expend the effort to count the cracks on this deck.

6B48 Combustible Materials – Combustible Material Stored Under the Bridge

Inspection > Agency Inspection; Form A > Structure Description

Description:

This item indicates the presence of combustible materials stored under the bridge.

Procedure:

Select the code from the dropdown list which indicates the type of combustible materials identified under the bridge. The coding of this field should be verified or updated for every bridge on every inspection. In addition to the coding below, details about the combustible materials should be entered in the Notes and Comments.

Coding:

- | | | | |
|---|----------------------------|----|--|
| 0 | Encampment | 7 | Combination of 4, 5, and/or 6 |
| 1 | Passenger Vehicle Parking | 8 | Occupied Structure(s) |
| 2 | Commercial Vehicle Parking | 9 | Other Structure(s) |
| 3 | Combination of 1 and 2 | 10 | Combination of 8 and 9 |
| 4 | Building Materials | 11 | Combination of any codes between 0 and 10 |
| 5 | Combustible Materials | 12 | No reportable materials beneath the bridge |
| 6 | Hazardous Materials | | |

Examples:

Parking for adjacent restaurant:

Pipes and gasoline for a construction project:

Storage shed for roadway salt:

Doctors office and parking lot:

Concrete barrier:

6B49 Inaccessible Area - Inaccessible Area of the Bridge during Inspection

Inspection > Agency Inspection; Form P > Current Overall Inspection Notes

Description:

This item is used to indicate if a portion of the structure is inaccessible during the inspection of the structure.

Procedure:

Select the code from the dropdown list which indicates the portion of the bridge that is inaccessible during an inspection of the structure. Selection for this field should be verified or updated for every bridge on every inspection if inaccessible areas exist, otherwise, leave blank. The inspector should also complete the inspection comment associated with field in either *iForms* or BMS2 to further explain why the location is inaccessible. Furthermore, the inspector should suggest updates to the Inspection Planning screen in BMS2 for equipment, such as a borescope, which may help with the inspection of these areas. This field should not be used to identify confined spaces. Suggestions for additional coding options should be sent to the Bridge Inspection Section.

Coding:

1	Combination of Any Below	5	Between Closely Spaced Members
2	Pin and Hanger Assembly	6	Enclosed Spans
3	Eyebar Head at Connections	7	Sandwiched Gusset Plates
4	Truss Pins		

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6C Agency - Roadway

The Agency Roadway Screen is used to record additional information concerning the roadway segments on and/or under the structure. Information should be entered for each roadway that is associated with a structure. A separate Agency Roadway screen is available for each roadway.

6C01 - 6C04 County, St Rte Num, Seg, Offset - State Roadway Location

Inventory > Features > Roadway; Form A - Vertical Clearance

Description:

This item is used to record location of the roadway in relation to the bridge. This number is comprised of four subfields. They are: 6C01 County, 6C02 State Route Number, 6C03 Segment Designation and 6C04 Offset.

The priority of state route data on the 6C screen is as follows: enter all state routes "on" the bridge and then add all state routes "under" the bridge. If no state route exists "on" the bridge, add "under" state routes accordingly.

Procedure:

These items are automatically filled in from RMS. Users shall verify the values that locate the Department's roadway segments that are either on and/or below the structure. **If no values are present for state routes, the BMS coordinator shall notify the RMS coordinator of the discrepancy.** These items will not have values for local routes because RMS does not store data for locals.

Coding:

The Agency Roadways screen's SR ID follows the same format as the bridge identification coding for the Department's jurisdictional bridges (see item 5A01).

Example: The bridge carries two state roadway segments on an undivided bridge over a stream. The bridge is in Dauphin County (22) and carries state route 322, segments 10 and 11, with offsets of 500 feet and 600 feet, respectively.

6C01	6C02	6C03	6C04
22	0322	0010	0500
22	0322	0011	0600

The bridge carries two state roadway segments on an undivided bridge over a state route. The bridge is in Dauphin County (22) and carries state route 322, segments 10 and 11, with offsets of 500 feet and 600 feet, respectively. The state route below, SR 2002, is in segment 60 and passes under at an offset of 1200 feet.

6C01	6C02	6C03	6C04
22	0322	0010	0500
22	0322	0011	0600
22	2002	0060	1200

6C05 Adm Juris - Administrative Jurisdiction

Inventory > Features > Roadway; Form A - Vertical Clearance

Description:

This item indicates the administrative jurisdiction for the highway. The organization having administrative jurisdiction over a highway is the agency responsible for the planning, design, and construction of the roadway.

Procedure:

Select the code from the dropdown list that indicates the jurisdiction for the highway on the bridge. For features other than highways, such as a railroad, this item should be coded "N" for not applicable.

Coding:

- 1 Pennsylvania Department of Transportation
- 2 Other State Agency
- 3 Federal Domain
- 4 Toll (such as PA Turnpike Commission or other toll commission)
- 5 County
- 6 Townships
- 7 City, Borough, or Other Local
- 8 Combination
- 9 Private
- N Non-highway related feature

6C06 Fed Aid - Federal Aid

Inventory > Features > Roadway

Description:

This item is used to identify the roadway on/under the structure and its Federal Aid status.

Procedure:

This item will be automatically entered for state routes inventoried in RMS. For local and other routes, this item should be entered manually.

Coding:

- 0 Not on Federal Aid Route
- 1 On Federal Aid Route
- 2 Other Federal Aid Route

6C07 Govt Cont - Government Level of Control

Inventory > Features > Roadway

Description:

This item is used to identify the level of government that has the responsibility for the facility. In the case of toll authorities, this code is not dependent upon a toll being charged. When more than one code could be used for a section, the lowest numerical code is reported (i.e., if county and town boundaries are the same and only one governing body exists, use code "02").

Procedure:

This item will be automatically entered for state routes inventoried in RMS. For local and other routes, this item should be entered manually.

Coding:

The Government Level of Control assigned to the SR ID.

01 State Highway Agency	31 State Toll Agency
02 County Highway Agency	32 Local Toll Agency
03 Town or Township Highway Agency	60 Other Federal Agencies (not listed below)
04 Municipal Highway Agency	62 Bureau of Indian Affairs
11 State Park, Forest or Reservation Agency	64 U.S. Forest Service
12 Local Park, Forest or Reservation Agency	66 National Park Service
21 Other State Agency	68 Bureau of Land Management
25 Other Local Agency	70 Military Reservation / Corps of Engineers
26 Private Agency	

6C08 Urban/Rural - Urban/Rural Designation

Inventory > Features > Roadway

Description:

This item indicates the Urban/Rural designation of a highway on or under the bridge.

Procedure:

This item will be automatically entered for state routes inventoried in RMS. For local and other routes, this item should be entered manually.

Coding:

The designation code assigned to the SR ID.

1	Rural
2	Small Urban (population 5,000 - 49,999)
3	Medium Urbanized (population 50,000 - 199,999)
4	Large Urbanized (population > 200,000)

6C09 Hwy Ind - Highway Indicator

Inventory > Features > Roadway

Description:

This item indicates whether or not the roadway on or under the bridge belongs to a state highway network.

Procedure:

This item will be automatically entered for state routes inventoried in RMS. For local and other routes, this item should be entered manually.

Coding:

H	National Highway System (NHS), (non-interstate)
I	Interstate
N	Non- Network
P	Principal Arterial

6C10 Hwy Sys Typ - Highway System

Inventory > Features > Roadway

Description:

This item indicates the type of Highway System of the highway feature being described. This item is no longer an FHWA required item.

Procedure:

Select the appropriate code from the dropdown list. The most applicable code should be used for any case that does not seem to have an appropriate code. A frontage road, for example, can be coded according to the system of adjacent mainline roadway.

If the feature is not a highway, code "NN" for not applicable.

If more than one route is on the bridge, use the proper code in this order.

- Interstate
- Federal-Aid Primary
- Federal-Aid Urban
- Federal-Aid Secondary
- Non-Federal-Aid

Note:

Local contracts must require identification of Federal-Aid bridges

Coding:

01	Interstate, Rural, Open to Traffic	09	Other State Highways, Rural (Non-FA)
02	Interstate, Urban, Open to Traffic	10	Other State Highways, Urban (Non-FA)
03	Other FA Primary, Rural	11	Local Rural Roads (or private rural roads)
04	Other FA Primary, Urban	12	Local City Streets (or private roads)
05	FA Secondary Rural, State Jurisdiction	14	Federal-Aid Urban
07	FA Secondary Rural, Local Jurisdiction	NN	Non-Highway Related Feature

6C11 State Code - State Highway Network

Inventory > Features > Roadway

Description:

This item is used to indicate the Highway Network Designation of the highway feature being described.

Procedure:

The Highway Network Designation is assigned by the Bureau of Transportation Systems performance.

Coding:

- 0 Not on a priority system
- 1 Priority commercial network
- 2 Core highway network
- 3 Agri-Access network
- 4 Industrial & Commercial Access network (ICAN) and Agri-Access network
- 5 Industrial & Commercial Access network (ICAN)

6C12 INT - Interstate Network (INT) Indicator

Inventory > Features > Roadway

Description:

This item indicates if the roadway belongs to the Interstate Network.

Procedure:

This item will be automatically entered for state routes inventoried in RMS. For valid state routes entered in the 5C and 6C screens for SR ID and the on/under fields, the "Interstate Network" designation is displayed based on information obtained from RMS.

Coding:

Yes Applicable Network
No Non-Applicable Network

6C13 (Not Used – Reserved for Future Use)

6C14 ATTT - ATTT Indicator

Inventory > Features > Roadway

Description:

This item indicates if the roadway on or under the bridge belongs to the Access Tandem Trailer Truck (ATTT) commercial network.

Procedure:

This item will be automatically entered for state routes inventoried in RMS. For valid state routes entered in the 5C and 6C screens for SR ID and the on/under fields, the "ATTT" designation is displayed based on information obtained from RMS.

Coding:

6 Unrestricted access
7 Restricted access
N No access

6C15 RMS NHS - RMS NHS Indicator

Inventory > Features > Roadway

Description:

This item indicates if the roadway on or under the bridge is on the National Highway System (NHS).

Procedure:

This item will be automatically entered for state routes inventoried in RMS. For valid state routes entered in the 5C and 6C screens for SR ID and the on/under fields, the "RMS NHS" designation is displayed based on information obtained from RMS.

Coding:

- | | | | |
|---|---|---|---|
| S | NHS, Strategic Highway Network (STRAHNET) | 4 | Major Amtrak Station |
| P | NHS, Congressional Priority Corridor | 5 | Major Rail/Truck Terminal |
| C | NHS, Major STRAHNET Connector | 6 | Major Intercity Bus Terminal |
| Y | NHS | 7 | Major Public Transit Terminal or Multi-Modal Passenger Terminal |
| N | Not NHS | 8 | Major Pipeline Terminal |
| 2 | Major Airport | 9 | Major Ferry Terminal |
| 3 | Major Port Facility | | |

6C16 TTTN - TTTN Indicator

Inventory > Features > Roadway

Description:

This item indicates if the roadway on or under the bridge is in the Tandem Trailer Truck Network (TTTN) commercial network.

Procedure:

This item will be automatically entered for state routes inventoried in RMS. For valid state routes entered in the 5C and 6C screens for SR ID and the on/under fields, the “TTTN” designation is displayed based on information obtained from RMS.

Coding:

- 1 Designated truck route under Federal and State Authority
- 2 Designated truck route under State Authority only
- 3 Parkway - not on a designated truck route
- 4 Not a Parkway - not on a designated truck route

6C17 - (Not Used - Reserved for Future Use)

***6C18 Horiz (L) - Total Horizontal Clearance for the Left Roadway**

Inventory > Features > Roadway; Form A - Vertical Clearance

Description:

This item is used to record the total horizontal clearance of the left roadway for FEATURES which are identified as streets or highways.

Procedure:

Divided Highways:

For a highway that is separated by a median barrier (MEDIAN TYPE coded 1-4, or 9 in Data Item 6C25), enter the total horizontal clearance for the left roadway.

Undivided Highways:

In the case of a highway not separated by a median barrier (MEDIAN TYPE coded 5, 7, or 0), enter the total horizontal clearance if the direction code in Data Item 5C06, 2nd subfield is a 3 or 4. Otherwise leave this item blank.

One Directional Highways:

For median code N or 6, enter the horizontal clearance if the direction code in Data Item 5C06, 2nd subfield is a 3 or 4. Otherwise leave this item blank.

The purpose of this item is to record the available clearance for the movement of wide loads. This clearance has been identified in three ways, all of which are acceptable:

- 1 Roadway surface and shoulders. This will generally be usable width for the movement of wide loads when the vertical clearance influences the horizontal clearance.
- 2 Distance from the face of the pier (or rail around the pier) to face or rail or slope at abutment.
- 3 Include flush or mountable medians (MEDIAN TYPE 6C25, coded as 5).

The total horizontal clearance should be the available clearance measured between the most restrictive features . . . curbs, rails, walls or other structural feature limiting the roadway. This item must be entered for all FEATURES, which are identified as streets or highways.

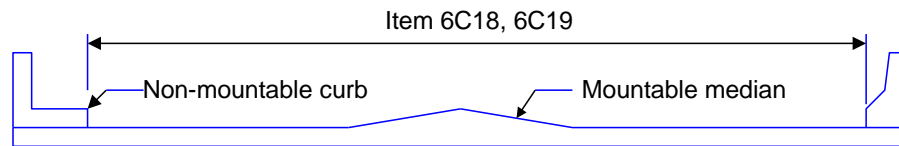
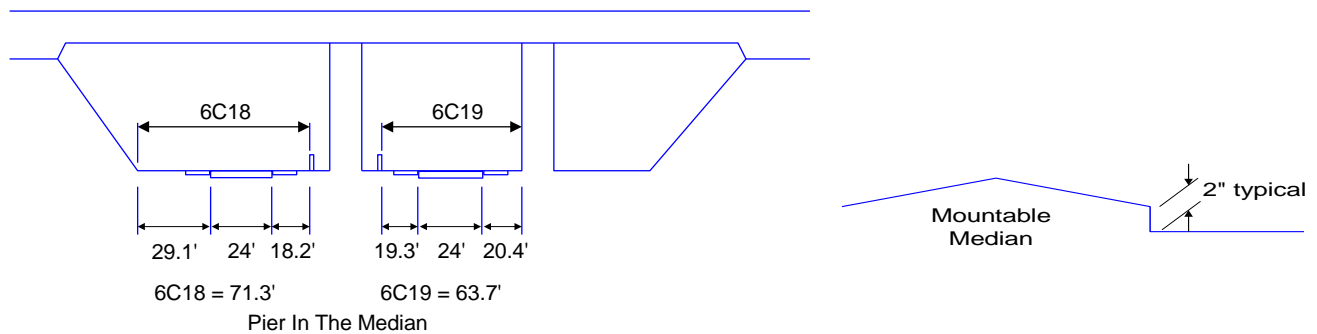
Coding:

The total horizontal clearance to the nearest tenth of a foot.

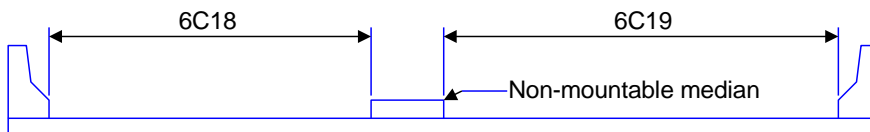
- 998 For clearances greater than 99.8 feet (Applicable for Old BMS only. BMS2 allows users to enter clearances greater than 99 feet.)
- Blank Not applicable

Note:

Mountable medians are designed to be driven over if need be.



No Median or Flush or Mountable Median



Raised Median or Non-mountable Median

***6C19 Horiz (R) - Total Horizontal Clearance for the Right Roadway**

Inventory > Features > Roadway; Form A - Vertical Clearance

Description:

This item is used to record the total horizontal clearance of the right roadway for FEATURES which are identified as streets or highways.

Procedure:**Divided Highways:**

For a highway that is separated by a median barrier (MEDIAN TYPE coded 1-4, or 9 in Data Item 6C25), enter the total horizontal clearance for the right roadway.

Undivided Highways:

In the case of a highway not separated by a median barrier (MEDIAN TYPE coded 5, 7, or 0), enter the total horizontal clearance if the direction code in Data Item 5C06, 2nd subfield is a 0, 1, or 2. Otherwise leave this item blank.

One Directional Highways:

For median code N or 6, enter the horizontal clearance if the direction code in Data Item 5C06, 2nd subfield is a 0, 1, or 2. Otherwise leave this item blank.

The purpose of this item is to record the available clearance for the movement of wide loads. This clearance has been identified in three ways, all of which are acceptable:

- 1 Roadway surface and shoulders. This will generally be usable width for the movement of wide loads when the vertical clearance influences the horizontal clearance.
- 2 Distance from the face of the pier (or rail around the pier) to face or rail or slope at abutment.
- 3 Include flush or mountable medians (MEDIAN TYPE 6C25, coded as 5).

The total horizontal clearance should be the available clearance measured between the most restrictive features . . . curbs, rails, walls or other structural feature limiting the roadway. This item must be entered for all FEATURES, which are identified as streets or highways.

Coding:

The total horizontal clearance to the nearest tenth of a foot.

998	For clearances greater than 99.8 feet (Applicable for Old BMS only. BMS2 allows users to enter clearances greater than 99 feet.)
Blank	Not applicable

Note:

Mountable medians are designed to be driven over if need be. See sketches after item 6C18.

*6C20 Min Vert (L) - Minimum Vertical Clearance for the Left Roadway 🚧

Inventory > Features > Roadway; Form A - Vertical Clearance

Description:

This item is used to record the actual minimum vertical clearance over the left roadway features (streets, highways) to any restriction, to the nearest hundredth of a foot.

Procedure:

Divided Highway:

For a highway that is separated by a median area or a median barrier (6C25 MEDIAN TYPE coded 1-5, 7 or 9), enter the minimum vertical clearance for the left roadway (i.e., southbound or westbound roadway). The left roadway value in this field must be the same for each of the divided highway features having the same route number.

Undivided Highway:

In the case of a highway not separated by a median area or a median barrier, code 99.90 and place the minimum vertical clearance in item 6C21.

Railroads (1):

In the case of a railroad, code 99.90 and place the minimum vertical clearance in item 6C21.

Coding:

9990 When no restriction exists or restriction is $\geq 99.9'$

Enter the minimum vertical clearance for sign structures in this data field.

The default value for this field is 99.90.

Note:

Measurements should be taken at each edge of all travel lanes for the under feature and the on feature.

- (1) Railroad Abandonment - If there is no abandonment order for the railroad in the District files, the vertical clearance is to be coded even if the tracks have been removed.
- (2) Refer to Pub. 238, Section IE 2.3.1, for clearance measurement when a roadway with a vertical sag curve passes beneath the structure.

Examples:

<u>Restriction</u>	<u>Code</u>
None	99.90
14.25 feet	14.25
100 feet	99.90

***6C21 Min Vert (R) - Minimum Vertical Clearance for the Right Roadway** 🚧

Inventory > Features > Roadway; Form A - Vertical Clearance

Description:

This item is used to record the actual minimum vertical clearance over the right roadway features (streets, highways,) to any restriction, to the nearest hundredth of a foot.

Procedure:**Divided Highway:**

For a highway that is separated by a median area or a median barrier (6C25 MEDIAN TYPE coded 1-5, 7 or 9), enter the minimum vertical clearance for the right roadway (i.e., northbound or eastbound roadway). The right roadway value in this field must be the same for each of the divided highway features having the same route number.

Undivided Highway:

In the case of a highway not separated by a median area or a median barrier (6C25 MEDIAN TYPE coded 6, 0 or N), enter the minimum vertical clearance based on all lanes regardless of traffic direction.

Railroads (1):

If the feature beneath the structure is a railroad, enter the minimum vertical clearance from the railroad track to the underside of the superstructure.

Coding:

9990 When no restriction exists or restriction is $\geq 99.9'$

Enter the minimum vertical clearance for sign structures in this data item.

The default value for this field is 99.90.

Note:

Measurements should be taken at each edge of all travel lanes for the under feature and the on feature.

- (1) Railroad Abandonment - If there is no abandonment order for the railroad in the District files, the minimum vertical clearance is to be coded even if the tracks have been removed.
- (2) Refer to Pub. 238, Section IE 2.3.1, for clearance measurement when a roadway with a vertical sag curve passes beneath the structure.

***6C22 Def Vert (L) - Vertical Clearance Over 10 Ft Width (Defense Highways) for Left Roadway** 🚧

Inventory > Features > Roadway; Form A - Vertical Clearance

Description:

This item is used to record the defense vertical clearance for the left roadway. The defense vertical clearance is defined as the maximum height a ten foot wide vehicle may be and still be able to pass along the feature being described.

Procedure:**Divided Highways:**

For a highway separated by a median area or a median barrier (6C25 MEDIAN TYPE coded 1-5, 7 or 9), enter the defense vertical clearance for the left roadway (i.e., southbound or westbound roadway). The left roadway value in this field must be the same for each of the divided highway features having the same route number.

Undivided Highways:

In the case of a highway not separated by a median area or a median barrier, code 99.90 and place the minimum vertical clearance in item 6C23.

Coding:

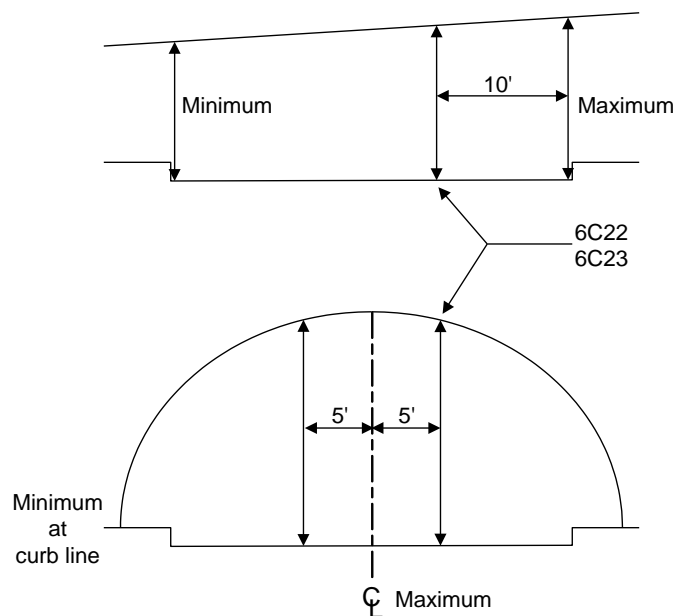
Defense vertical clearance to the nearest hundredth of a foot. Value must be ≥ 0 and cannot be left blank.

When no restriction exists above the roadway, the defense vertical clearance is unlimited and should be entered as 9990.

9990 Restriction is $\geq 99.9'$

Note:

The 10' width envelope is measured from the point of maximum vertical clearance toward a point of lesser clearance.



***6C23 Def Vert (R) - Vertical Clearance Over 10 Ft Width (Defense Highways) for Right Roadway**

Inventory > Features > Roadway; Form A - Vertical Clearance

Description:

This item is used to record the defense vertical clearance for the right roadway. The defense vertical clearance is defined as the maximum height a ten foot wide vehicle may be and still be able to pass along the feature being described.

Procedure:

Divided Highways:

For a highway separated by a median area or a median barrier (6C25 MEDIAN TYPE coded 1-5, 7 or 9), enter the defense vertical clearance for the right roadway (i.e., northbound or eastbound roadway). The right roadway value in this field must be the same for each of the divided highway features having the same route number.

Undivided Highways:

In the case of a highway not separated by a median area or a median barrier (6C25 MEDIAN TYPE coded 6, 0 or N), enter the minimum defense vertical clearance based on all lanes regardless of traffic direction.

Coding:

Defense vertical clearance to the nearest hundredth of a foot. Value must be ≥ 0 and cannot be left blank.

When no restriction exists above the roadway, the defense vertical clearance is unlimited and should be entered as 9990.

9990 Restriction is $\geq 99.9'$

Note:

The 10' width envelope is measured from the point of maximum vertical clearance toward a point of lesser clearance. See sketch after item 6C22.

6C24 (Not Used – Use Fields 6C35 through 6C38)***6C25 Type - Median Type**

Inventory > Features > Roadway

Description:

This item is used to code the type of median on a structure or the type of median separating the roadways (in opposite direction of travel) under the structure.

Procedure:

Select the type of median from the dropdown list. This item should be coded for any feature intersected that is a highway on or under the bridge.

Coding:

- 0 No Box beam barrier median, no barrier between opposite traffic
- 1 Box Beam Barrier
- 2 W-Type barrier
- 3 Concrete barrier
- 4 Pier in median
- 5 Concrete mountable curb
- 6 One of the dual (parallel) bridges
- 7 Grass or unprotected median (no barrier or no mountable curb)
- 8 Other
- 9 Non-mountable median
- N Not applicable (1 lane traffic or non-highway related feature)

6C26 Width - Median Width

Inventory > Features > Roadway

Description:

This item is used to record the width of the median, where applicable.

Procedure:

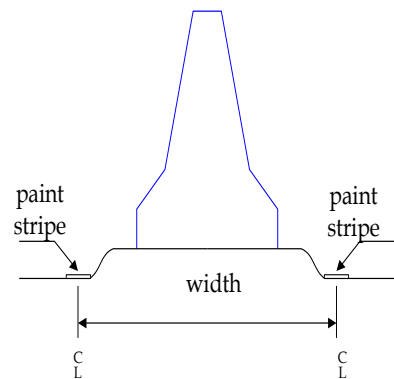
Enter the width of the median to the nearest foot. The median width is the distance between inside edges of through lanes.

This item should be coded for any feature intersected that is a highway on or under the bridge.

Coding:

The median width to the nearest foot. It is the distance between the inside edges of through lanes of roadways in opposite direction of travel. Measure from one paint stripe to the paint stripe on the opposite side of the median.

This subfield should be coded "0" when 6C25 is coded "6", "0" or "N".



6C27 ADTT - Average Daily Truck Traffic

Inventory > Features > Roadway

Description:

This item is used to record the "current" average annual daily truck traffic volume.

Procedure:

This item will be automatically entered for state routes inventoried in RMS. For local and other routes, this item should be entered manually.

In those cases where a structure is carrying multiple state routes these values may have to be combined for FHWA reporting purposes.

Coding:

The number of trucks per day.

6C28 ADTT Year - Year of Average Daily truck Traffic

Inventory > Features > Roadway

Description:

This item is used to record the "current" year of the ADTT count.

Procedure:

This item will be automatically entered by the system for state routes based on data that it obtains from RMS. For local and other routes, this item should be entered manually. If this information is not available, a best estimate is recommended.

Coding:

The year of the average annual daily truck traffic

6C29 (Not Used – Reserved for Future Use)

6C30 Gen Seg Ahead Lbl - General Segment Ahead Label

Inventory > Features > Roadway

Description:

This item is used to record a description of the roadway segment ahead.

Procedure:

This item is automatically filled in from APRAS.

6C31 User Seg Ahead Lbl - User Segment Ahead Label

Inventory > Features > Roadway

Description:

This item is used to record a description of the roadway segment ahead.

Procedure:

Enter a description of the roadway segment ahead in narrative form.

6C32 Gen Seg Back Lbl - General Segment Back Label

Inventory > Features > Roadway

Description:

This item is used to record a description of the roadway segment behind.

Procedure:

This item is automatically filled in from APRAS.

6C33 User Seg Back Lbl - User Segment Back Label

Inventory > Features > Roadway

Description:

This item is used to record a description of the roadway segment behind.

Procedure:

Enter a description of the roadway segment behind in narrative form.

6C34 Feature Type

Inventory > Features > Roadway

Description:

This item is used to record the description of the type of each feature.

Procedure:

This item will be automatically entered for state routes inventoried in RMS. For local and other routes, this item should be entered manually. Select the feature type for each “on” and “under” feature from the dropdown list. Features that are open to public traffic should be coded as “1-Highway”. Features other than highways, railroads, and waterways that are not open to public traffic should be coded as “4-Other”. Examples include private roads, pedestrian/bike routes, trails, canal towpaths, golf cart paths, airport runways, parking lots, conveyors, wildlife underpasses, wharfs, bluffs, etc.

Coding:

- 1-Highway
- 2-Railroad
- 3-Waterway
- 4-Other

6C35 Vert Clear Sign Left - Vertical Clearance Signing Left

Inventory > Features > Roadway; Form A > Vertical Clearance

Description:

This item is used to record the presence of any vertical clearance posting sign for the feature identified under “Feature Description”, Data Item 5C01. This field reflects the signage for the left roadway (southbound or westbound).

Procedure:

Select the appropriate code from the dropdown list. Vertical clearance posting signs are required when the actual vertical clearance is below 14’-6”. The measurement on the sign should be recorded in Item 6C37. The actual vertical clearance measured in the field should be stored in Items 6C20 and 6C21.

Coding:

- 0 Signs not required and not existing
- 1 Signs required and existing
- 2 Signs required and not existing
- 3 Existing signs do not agree with the measurements and need to be replaced

Examples:

The vertical clearance measured between the roadway and the underside of the bridge was 14’-5”. The vertical clearance posted on the sign should read 14’-2” or below to include the 3” buffer as described in Publications 236 and 238.

The vertical clearance measured between the roadway and the underside of the bridge was 14’-9”. The vertical clearance is 14’-6”, including the 3” buffer, which is 12” greater than the maximum legal height vehicle of 13’-6” and vertical clearance signage is not required.

6C36 Vert Clear Sign Right - Vertical Clearance Signing Right

Inventory > Features > Roadway; Form A > Vertical Clearance

Description:

This item is used to record the presence of any vertical clearance posting sign for the feature identified under "Feature Description", Data Item 5C01. This field reflects the signage for the right roadway (northbound or eastbound).

Procedure:

Select the appropriate code from the dropdown list. Vertical clearance posting signs are required when the actual vertical clearance is below 14'-6". The measurement on the sign should be recorded in Item 6C38. The actual vertical clearance measured in the field should be stored in Items 6C20 and 6C21.

Coding:

- 0 Signs not required and not existing
- 1 Signs required and existing
- 2 Signs required and not existing
- 3 Existing signs do not agree with the measurements and need to be replaced

Examples:

The vertical clearance measured between the roadway and the underside of the bridge was 14'-5". The vertical clearance posted on the sign should read 14'-2" or below to include the 3" buffer as described in Publications 236 and 238.

The vertical clearance measured between the roadway and the underside of the bridge was 14'-9". The vertical clearance is 14'-6", including the 3" buffer, which is 12" greater than the maximum legal height vehicle of 13'-6" and vertical clearance signage is not required.

6C37 Vert Clear Post Left - Vertical Clearance Sign Posting Left

Inventory > Features > Roadway; Form A > Vertical Clearance

Description:

This item is used to record the measurement on any vertical clearance posting sign for the feature identified under "Feature Description", Data Item 5C01. This field reflects the signage for the left roadway (southbound or westbound).

Procedure:

This is a two part field. Enter the feet in the first box and the inches in the second box.

Coding:

Enter the vertical clearance value displayed on the sign.

Example: The vertical clearance sign shows a value of 14'-2". Enter 14' in the first box and 2" in the second box.

6C38 Vert Clear Post Right - Vertical Clearance Sign Posting Right

Inventory > Features > Roadway; Form A > Vertical Clearance

Description:

This item is used to record the measurement on any vertical clearance posting sign for the feature identified under "Feature Description", Data Item 5C01. This field reflects the signage for the right roadway (northbound or eastbound).

Procedure:

This is a two part field. Enter the feet in the first box and the inches in the second box.

Coding:

Enter the vertical clearance value displayed on the sign.

Example: The vertical clearance sign shows a value of 13'-11". Enter 13' in the first box and 11" in the second box.

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7A Inspection Schedule

The Inspection Schedule Screen contains information about the most recent inspection on the structure, as well as the dates of the next scheduled inspections. It also shows information on established policies for the structure regarding the frequency of regular and special inspections, and estimated resource requirements. In this portion of the screen, inspection planning information is normally entered and updated.

*7A01 Inspection Date

Inspection > Ratings & Schedule; *i*Forms Header

Description:

This item is used to record the date of the inspection of the bridge.

Procedure:

Enter the date (month-day-year) on which the bridge was last inspected. This date will typically be entered based on information from *i*Forms. Refer to IN16 in cases when probing of substructure units cannot be completed.

Coding:

The inspection date (month-day-year). Prefix with zeros where necessary.

Example:

Assume an inspection date of March 7, 1979:

Note:

Code sign structures and retaining walls the same.

7A02 Team Leader

Inspection > Ratings & Schedule; Form P > Current Inspection

Description:

This item is used to record the name of the team leader who performed the bridge inspection.

Procedure:

Select the name of the team leader who performed the inspection from the dropdown list.

Coding:

Name of team leader who performed the current inspection.

*7A03 Primary Type - Primary Type of Inspection

Inspection > Ratings & Schedule; Form P > Current Inspection

Description:

This item is used to record the primary type of inspection that was performed on the bridge.

Procedure:

Select the 7A03 code from the following table that identifies the type of inspection that was performed on the bridge. For each 7A03 inspection type, the table identifies:

- Its applicability to fulfill the various types of NBI Compliance Inspections.
- Its applicability to meet the required frequencies for the 24/48 month NBI inspection and/or reduced interval inspections.
- The coding of checkboxes for 7A06 Inspections Performed.
- The coding is also applicable for inspection types in BMS2 items 6B20, IW01, and IS01.

This table is a duplicate of Table IP 2.3.2.5-4 of Pub 238. For further discussion of inspection types, NBIS compliance and frequencies, see Pub 238 IP 02.3.

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Coding:

Insp types also applicable to 6B20		Meets requirements		Checkboxes for 7A06 Inspection Performed					<p><u>7A06 Coding - See Examples after Item 7A09</u></p> <input checked="" type="checkbox"/> Performed - Check box of inspections performed <input type="checkbox"/> Not Performed - Uncheck the box <input checked="" type="checkbox"/> CHECKED/UNCHECKED, AS PERFORMED If performed, check the box. <input checked="" type="checkbox"/> If NOT performed, uncheck the box. <input type="checkbox"/>
		NBI	OS	NBI	FC	Underwater	Other Special	Element	
7A03	Primary Inspection Type**	24/48 months	≤ 24 months						
SECTION 1 NBIS Compliance Inspection Types (See IP 2.3.2.5)									
R	Routine	YES	YES	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	- NBI Inspection# - Must include hands-on for FCMs as per Fatigue & Fracture (F&F) Plan - Other Special (Interim) Inspection also checked when this inspection type is used to satisfy reduced interval - May include element insp., probing of substructure
C	Routine Using Crane	YES	YES	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	- NBI Inspection# - A complete routine inspection of bridges where the inspection crane is utilized - Other Special (Interim) Inspection also checked when this inspection type is used to satisfy reduced interval - Must include hands-on for FCMs as per F&F Plan
I	Other Special (Interim)	NO	YES	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	- NOT an NBI Inspection# - Use ONLY to meet reduced interval for Other Special (Interim) Inspections - Must include hands-on for FCMs as per F&F Plan
F	Initial (First Time)	YES	Not Appl.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	- NBI Inspection# - 1st time inspection of new or re-constructed bridge - 48 month NBI interval does not apply to Initial (First Time) Inspection type - Must include hands-on for FCMs as per F&F Plan
U	Underwater Only (DIVING)	NO	YES	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	- NOT an NBI Inspection# - Meets NBIS requirements for UW Inspection only - Stand-alone underwater inspection by DIVING - Add a separate inspection 7A03 = I if the OS(I) scope extends beyond the "underwater only" inspection
W	Routine with Underwater (DIVING)	YES	YES	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	- NBI Inspection# - Meets requirements of Routine Inspection - Includes underwater inspection (by DIVING). - Must include hands-on for FCMs as per F&F Plan - Other Special (Interim) Inspection also checked when this inspection type is used to satisfy reduced interval
SECTION 2 Additional Inspection Types (highway bridges)									
A	Access Equipment Only	NO	NO	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	- Not an NBI Inspection# - Limited inspection with special access equipment - If used to meet reduced interval of Other Special (Interim) Inspections, set Inspection Type 7A03 = I
B	Damage	NO	NO	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	- Not an NBI Inspection# - Limited to damaged elements - If used to meet reduced interval of Other Special (Interim) Inspections, set Inspection Type 7A03 = I or U if completed by divers. - Check the 7A06 and 7A07 boxes for Other Special when initiating a newly required reduced inspection interval - Typical uses: Collision damage and post-flood

TABLE PAGE 1 OF 2

**7A03 Inspection Types R, C, F, U, W, B, & P may also be used for 8'-20' bridges (non-NBIS length)

Record crane or equipment use on BMS2 Screen VI (Inspection Planning)

Insp types also applicable to 6B20		Meets requirements		Checkboxes for 7A06 Inspection Performed					7A06 Coding – See Examples after Item 7A09 <input checked="" type="checkbox"/> Performed – Check box of inspections performed <input type="checkbox"/> Not Performed – Uncheck the box <input checked="" type="checkbox"/> CHECKED/UNCHECKED, AS PERFORMED If performed, check the box. <input checked="" type="checkbox"/> If NOT performed, uncheck the box. <input type="checkbox"/>
		NBI	OS	NBI	FC	Underwater	Other Special	Element	
7A03	Primary Inspection Type**	24/48 months	≤ 24 months	NBI	FC	Underwater	Other Special	Element	
D	In-Depth	NO	NO	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	- Not an NBI Inspection# - Inspection limited to portions of bridge - If Inspection scope suffices for NBI inspection, code Inspection Type 7A03 = R, C or W - If used only to meet a more frequent Other Special (Interim) Inspection, set Insp. Type 7A03 = I
E	Element Inventory Only	NO	NO	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	- Not an NBI Inspection# - Inventory only of element level data.
G	Fracture Critical			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	- NOT AVAILABLE FOR NEW INSPECTIONS - Maintained for historical information only of code identification from superseded BMS AJ screen.
P	Problem Area	NO	NO	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	- NOT an NBI Inspection# - One time inspection limited to critical area(s). - If used to meet reduced interval for Other Special (Interim) Inspection, set 7A03 = I or U if completed by divers.
Z	Inventory Only	NO	NO	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	- Not an NBI Inspection# - Used for inventory all bridges and other structures
Section 3 Additional Inspection Types (non-highway bridges and structures)									
H	Highway Environs Only	NO	NO	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	- Inspection of non-highway bridges/structures over highways. Inspection limited to highway environs. #
L	High Mast Light Poles	NO	NO	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	- Add "checkmark" to 7A06 NBI only if IS01 = A or D which are NBI-like Inspection of high mast light poles, their foundations, anchor bolts and other components. #
M	Miscellaneous	NO	NO	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	- NBI-like inspection of other miscellaneous structures NOT over highways, including Pedestrian bridges, Rail bridges, etc. #
O	Overhead Non-Highway	NO	NO	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	- NBI-like inspection of structural components of overhead non-highway bridges. #
S	Sign Structure	NO	NO	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	- Add "checkmark" to 7A06 NBI only if IS01 = A, B, C, or D which are NBI-like inspection for sign structures. #
T	Retaining and Noise Wall	NO	NO	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	- Add "checkmark" to 7A06 NBI only if IW01 = F, R, or D which are NBI-like inspection for retaining walls and noise walls. #
X	Unknown	NO	NO	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	- Generally, this applies to an errant record only. #

TABLE PAGE 2 OF 2

**7A03 Inspection Types R, C, F, U, W, B, & P may also be used for 8'-20' bridges (non-NBIS length)

Record crane or equipment use on BMS2 Screen VI (Inspection Planning)

See examples after Item 7A09

Old BMS codes for inspection types prior to 2006 (included here for information only):

- | | | | |
|--------------------------------------|--|---|--|
| 1 | Initial NBIS | 5 | Special areas only – management directed |
| 2 | Regular NBIS | 6 | Personnel lift only |
| 3 | Regular NBIS including underwater | 7 | Inspection crane only |
| <u>Codes 4-9 special inspections</u> | | 8 | Rigging only |
| 4 | Problem areas only (existing and/or potential) | 9 | Underwater only |

7A04 Review Required

Inspection > Ratings & Schedule

Description:

This checkbox field is used to indicate whether or not the inspection results should be reviewed.

Procedure:

This item will not be used by PennDOT. No entry is required.

7A05 Inspected By - Inspection Performed By

Inspection > Ratings & Schedule; Form P > Current Inspection

Description:

This item is used to record the name of the responsible group that inspected the bridge. If a Department or other owner's inspection team performed the inspection then team member names, initials, or just the name of the team leader may be inserted here.

Procedure:

Enter the name of the consulting firm, inspector names, initials, or other identifiers.

Coding:

- | | |
|-----|--|
| A-Z | Letter assigned by District to individual Department Force Inspection Team |
| 1 | PennDOT (codes A-Z may be used instead) |
| 2 | County |
| 3 | City, Borough, or Township |
| 4 | PA Turnpike Commission |
| 5 | Delaware River Joint Toll Bridge Commission |
| 6 | Other State Agency |
| 7 | Railroad |
| 8 | Consulting Firm |
| 9 | Other (includes Federal Agency) |

7A05a Inspection Organization Name - Team Leader Organization

Inspection > Ratings & Schedule; Form P > Current Inspection

Description:

This item is used to record the name of the organization associated with the team leader who inspected the bridge. This data is collected from ECMS and is associated with the individual team leaders within Item 7A02.

Procedure:

This item will be **automatically filled in by the system** based on the name selected in Item 7A02. Within BMS2, this field will update on saving the screen. Within iForms, the field will update immediately upon the selection of a new team leader.

Coding:

PennDOT or Business Partner Name.

*7A06 Inspection Performed - Type of Compliance Inspections Performed

Inspection > Ratings & Schedule; Form P > Current Inspection

Description:

This series of five checkbox fields is used to indicate which types of Compliance Inspections have been performed during the current inspection: National Bridge Inventory (NBI), Fracture Critical, Underwater, Other Special, and Element. See Publication 238, Section IP 2.3 - General Types of Bridge Safety Inspections for more discussion of Compliance Inspections.

Procedure:

The inspector must check the appropriate data box(es) to indicate each type of inspection performed. See the Table for Item 7A03 for coding checkbox Item 7A06 in conjunction with Item 7A03 Primary Inspection Type. **If completing an Element Level inspection, the inspector MUST check the 7A06 Element Box or the data will not be uploaded to BMS2 and will not appear on the Elements screen.**

- Multiple 7A06 data boxes can be checked for a single inspection date.
 - For example: NBI, Fracture Critical, and Element would be checked if inspections of that type were performed on the same date.
- When divers are used for Underwater Inspections (either diving or probing):
 - Check the 7A06 data box for Underwater.
- When probing by an inspector is used as the method of access to inspect the submerged portions of substructure units during a Routine Inspection, 7A03 = R, C, or F.
 - Uncheck the 7A06 data box for Underwater.
- When a reduced inspection interval is required by Table 2.3.2.4-1 and inspection performed meets the requirements of a Routine Inspection, 7A03 = R, C, or W:
 - Check the 7A06 data boxes for NBI and Other Special.
 - Check the 7A06 data box for Fracture Critical when a hands-on inspection is performed on bridges with FCMs.
- When a reduced inspection interval is required by Table 2.3.2.4-1 and the inspection performed meets the requirements of an Interim inspection, 7A03 = I:
 - Check the 7A06 data box for Other Special.
 - Check the 7A06 data box for Fracture Critical when a limited-scope hands-on inspection is performed on bridges with FCMs.
 - Uncheck the NBI data box.
- When a reduced inspection interval is required by Table 2.3.2.4-1 and the inspection performed is completed by divers and meets the requirements of an Interim inspection, 7A03 = U:

- Check the 7A06 data box for Other Special and Underwater.
- Uncheck the NBI data box.
- When “NBI-like” Inspections are performed on non-NBIS bridges or other structures (sign structures, high mast light poles, walls, etc.)
 - Check the 7A06 data boxes for NBI.
 - “NBI-like” inspections are not reported to FHWA because it is not an NBIS bridge, Item 5E01=N.
- When an Element Inspection was performed:
 - Check the 7A06 data box for Element.
 - The updated element information will upload to BMS2 during the iForms submission.
- When an Element Inspection was NOT performed:
 - Uncheck the 7A06 data box for Element.
 - *Inspectors were previously instructed to check the 7A06 data box if an Element Inspection was not completed; iForms release 3.0.1 removed this requirement.*
- Inspectors are no longer required to add notes to 2A02 if an Element Inspection is not completed.

Coding:

For each inspection type (NBI, Element, Fracture Critical, Underwater, or Other Special):

Unchecked	Inspection of this type was not performed
Checked	Inspection of this type was performed

Examples: See examples after 7A09

*7A07 Required (Y/N) - Required Inspections

Inspection > Ratings & Schedule; Form P > Next Inspection

Description:

This series of three checkbox fields is used to indicate whether or not Fracture Critical, Underwater, and/or Other Special inspections are required for the structure under the NBIS regulations for Critical Feature Inspections. When checked as being required, these inspections are reported to FHWA as Special Feature Inspections in NBI Items 92 and 93.

Procedure:

This data should be established prior to the inspection and reviewed after the inspection for any necessary revisions.

The appropriate boxes should be checked or unchecked to indicate whether Fracture Critical, Underwater and/or Other Special inspections are required for the structure at the frequency specified in Item 7A09.

- NBI inspections are required for all bridges, so no check box is needed or provided.
- Fracture Critical inspections are required for all bridges with FCMs. See BMS2 Item 6A44 Fracture Critical Group < 5.
- Underwater inspections are required when the underwater portions of a substructure unit cannot be inspected using wading techniques; a diver is needed to perform the inspection.
- Other Special Inspections are to be required when bridge conditions necessitate a reduced interval inspection (< 24 month NBI) to ensure the bridge’s safety. Publication 238, Table IP 2.3.2.4-1 identifies the bridge conditions that necessitate a reduced interval inspection.
- Element inspections are not currently required by NBIS, so no inspection required check box is provided. Element inspections may be required by Department policies or inspection agreement.

For additional discussion of policies and procedures for required inspections, see Publication 238, Section IP 2.3.2.5.

Once entered into BMS2, Item 7A07 for the 4 compliance inspection types is copied by BMS2/iForms for the subsequent inspections.

Note:

Having 7A07 data box checked to indicate a required Compliance Type inspection does not necessarily mean that each required inspection type must be performed for every inspection. The required types of inspection due at each inspection will be governed by the frequency interval specified in 7A09.

Coding:

For each inspection type (Fracture Critical, Underwater, Other Special):

Unchecked	Inspection of this type is not required
Checked	Inspection of this type is required

Examples: See examples after 7A09

***7A08 Last Dt - Last Inspection Date** 

Inspection > Ratings & Schedule

Description:

This series of four fields (for NBI, Fracture Critical, Underwater, and Other Special (Element is excluded)) is used to record the date of the last inspection prior to the current inspection for the structure, by type of inspection.

Notes:

1. 7A08 is computed by BMS2 when the re-compute/calculate button on the BMS2 screen is pushed. This function is available in BMS2 Web.
2. For 7A08 to calculate correctly, previous inspections must have the correct boxes checked for Field 7A06.

Procedure:

The date of the last inspection prior to the current inspection is shown for the selected structure. This date is automatically entered and should not be adjusted by the inspector. Discrepancies shall be reported to the BMS2 coordinator.

Coding:

Date of last inspection in MM/DD/YYYY format.

***7A09 Freq - Inspection Frequency**

Inspection > Ratings & Schedule; Form P > Next Inspection

Description:

This series of five fields is used to specify the number of months between inspections, by type of inspection.

Procedure:

This data should be established prior to the inspection and reviewed after the inspection for any necessary revisions for future inspections.

Enter the number of months from the last until the next inspection is due for each inspection type: NBI, Element, Fracture Critical, Underwater, and Other Special.

For non-bridge structures, the 7A09 NBI value is also to be entered into the inspection frequency data field for each type of structure: Sign structures in IS13, high mast light poles in IS13, and walls in IW13.

Coding:

Number of months for each inspection type.

NBI:

- Refer to Publication 238 Table 2.3.2.4-1 for the maximum interval for Routine inspections. The NBI frequency shall not exceed 24 months for bridges greater than 20 ft.
- When a reduced interval inspection is required by bridge conditions, per Table 2.3.2.4-1, the NBI frequency = 24 months.
- For other structures (sign structures, high mast light poles, walls, etc.), 7A09 NBI is to be set to required frequency for that structure type and condition.

Fracture Critical:

- A Fracture Critical inspection frequency is required for all bridges with FCMs.
- A reduced inspection interval, per Pub 238 Table IP 2.3.2.4-1, can be required due to certain condition ratings of the superstructure. The scope and intensity of the Fracture Critical inspection is to be specified in the Fatigue & Fracture Inspection Plan.
- When a bridge with FCMs has a reduced inspection interval due to conditions not related to the FCMs, Fracture Critical Inspection frequency can be greater than Other Special frequency. For example, a two span fracture critical bridge with superstructure in good condition but with a temporary support at pier due to deterioration of concrete pedestal, 7A09 values would be:
 - NBI = 24 months
 - Fracture Critical = 24 months
 - Other Special = 6 months

Underwater:

- Refer to Publication 238, Table IP 2.6.2.4-1, for required underwater inspection intervals.

Other Special:

- When bridge conditions warrant reduced inspection intervals as outlined in Publication 238, Table 2.3.2.4-1.

Element:

- For bridges that require an element level inspection, the frequency is identical to the NBI inspection frequency.

FREQUENCY NOTES:

1. If 7A07 Required Inspections = Unchecked box, then 7A09 = -1 (by default).
2. Other Special inspections and NBI inspections will both be required on same date when the Other Special frequency is a factor of 24 months. See Item 7A06 for related instructions.
3. Do NOT Use frequencies of 24 months for both NBI and Other Special inspections by scheduling the inspections in alternating years so the apparent result is 12 month intervals. This practice results in NBI Item 92 errors. The correct 7A09 values are NBI = 24 months and Other Special = 12 months.

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Examples of Coding for Items 7A03, 7A06, 7A07, and 7A09:

Examples for Coding Scheduling and Compliance Data including: 7A03, 7A06, 7A07, and 7A09		Compliance Inspection Type	7A07 Insp Req'd	7A09 Insp Freq	7A06 Insp Perf'd
1. Routine inspection of a state-owned 168' long through truss carrying a highway over a stream. <ul style="list-style-type: none"> Fracture Critical Bridge - not weight restricted. Bridge does not meet extended inspection interval requirements (Superstructure is Fracture Critical). Super and sub conditions do not warrant inspection frequency < 24 months. Substructure units can be inspected by wading and probing. An element inspection was required and performed. Inspection crane utilized. <p style="text-align: right;"><i>Primary Inspection Type 7A03 = C</i></p>	NBI		24	<input checked="" type="checkbox"/>	
	Fracture Critical	<input checked="" type="checkbox"/>	24	<input checked="" type="checkbox"/>	
	Underwater	<input type="checkbox"/>	-1	<input type="checkbox"/>	
	Other Special	<input type="checkbox"/>	-1	<input type="checkbox"/>	
	Element	<input checked="" type="checkbox"/>	24	<input checked="" type="checkbox"/>	
	Note: For 7A09 UW and OS, see Pub 238 Tables IP 2.3.2.4-1 and 2.6.2.4-1 (Typical).				
2. Routine inspection of a 98' long state-owned GFS bridge over a stream. <ul style="list-style-type: none"> Fracture Critical Bridge. Conditions: Super 4, Sub 6 Bridge does not meet extended inspection interval requirements (Superstructure is Fracture Critical). Weight restricted - Posted for 20 Tons due to loss of section in fracture critical floorbeams. Rigging used to access fracture critical members. Substructure units can be inspected by wading and probing. An element inspection was required and performed. <p style="text-align: right;"><i>Primary Inspection Type 7A03 = R</i></p>	NBI		24	<input checked="" type="checkbox"/>	
	Fracture Critical	<input checked="" type="checkbox"/>	12	<input checked="" type="checkbox"/>	
	Underwater	<input type="checkbox"/>	-1	<input type="checkbox"/>	
	Other Special	<input checked="" type="checkbox"/>	12	<input checked="" type="checkbox"/>	
	Element	<input checked="" type="checkbox"/>	24	<input checked="" type="checkbox"/>	
3. Routine inspection of a state-owned 72' long P/S concrete spread box beam bridge carrying a highway over a stream. <ul style="list-style-type: none"> Bridge does not meet extended inspection interval requirements (Superstructure Condition Code is 5). No FCMs - Not weight restricted. Super and sub conditions do not warrant inspection frequency < 24 months. Substructure units can be inspected by wading and probing. An element inspection was required and performed. <p style="text-align: right;"><i>Primary Inspection Type 7A03 = R</i></p>	NBI		24	<input checked="" type="checkbox"/>	
	Fracture Critical	<input type="checkbox"/>	-1	<input type="checkbox"/>	
	Underwater	<input type="checkbox"/>	-1	<input type="checkbox"/>	
	Other Special	<input type="checkbox"/>	-1	<input type="checkbox"/>	
	Element	<input checked="" type="checkbox"/>	24	<input checked="" type="checkbox"/>	
4. In-Depth inspection of a local, non-NHS, 86' GFS bridge carrying a highway over a stream. In-Depth inspection met all requirements for NBI inspection. <ul style="list-style-type: none"> Fracture Critical - Not weight restricted. Bridge does not meet extended inspection interval requirements (Local Bridge). Super and sub conditions do not warrant inspection frequency < 24 months. Rigging used to access fracture critical members. Substructure units can be inspected by wading and probing. An element inspection was not required and not performed. <p style="text-align: right;"><i>Primary Inspection Type 7A03 = R</i></p>	NBI		24	<input checked="" type="checkbox"/>	
	Fracture Critical	<input checked="" type="checkbox"/>	24	<input checked="" type="checkbox"/>	
	Underwater	<input type="checkbox"/>	-1	<input type="checkbox"/>	
	Other Special	<input type="checkbox"/>	-1	<input type="checkbox"/>	
	Element	<input type="checkbox"/>	-1	<input type="checkbox"/>	

Examples of Coding for Items 7A03, 7A06, 7A07, and 7A09 (cont.):

Examples for Coding Scheduling and Compliance Data including: 7A03, 7A06, 7A07, and 7A09		Compliance Inspection Type	7A07 Insp Req'd	7A09 Insp Freq	7A06 Insp Perf'd
5. In-Depth inspection of a local, NHS, 40' RC T-Beam carrying a highway over stream. Inspection limited to hands-on inspection of beams only. <ul style="list-style-type: none"> Bridge does not meet extended inspection interval requirements (Local Bridge). No FCMs - Not weight restricted. Super and sub conditions do not warrant inspection frequency < 24 months. Substructure units not inspected. An element inspection was performed in the past, but not updated at this time. <p style="text-align: right;"><i>Primary Inspection Type 7A03 = D</i></p>	NBI		24	<input type="checkbox"/>	
	Fracture Critical	<input type="checkbox"/>	-1	<input type="checkbox"/>	
	Underwater	<input type="checkbox"/>	-1	<input type="checkbox"/>	
	Other Special	<input type="checkbox"/>	-1	<input type="checkbox"/>	
	Element	<input checked="" type="checkbox"/>	24	<input type="checkbox"/>	
6. Other Special (Interim) inspection of a state-owned, 120' long steel multi-girder bridge over a stream. <ul style="list-style-type: none"> No FCMs - Weight restricted "One truck at a time" posting. Bridge does not meet extended inspection interval requirements (Bridge is Posted). Super and substructure in FAIR condition. Substructure units can be inspected by wading and probing. An element inspection performed in past, but not updated at this time. <p style="text-align: right;"><i>Primary Inspection Type 7A03 = I</i></p>	NBI		24	<input type="checkbox"/>	
	Fracture Critical	<input type="checkbox"/>	-1	<input type="checkbox"/>	
	Underwater	<input type="checkbox"/>	-1	<input type="checkbox"/>	
	Other Special	<input checked="" type="checkbox"/>	12	<input checked="" type="checkbox"/>	
	Element	<input checked="" type="checkbox"/>	24	<input type="checkbox"/>	
7. Underwater inspection by divers of a local NHS, 70' long steel multi-girder bridge carrying a highway over a stream. <ul style="list-style-type: none"> No FCMs - Weight restricted "One truck at a time" posting. Super and substructure in FAIR condition. 4A08 SCBI = 3; Minimum water depth at far abutment = 5'. Bridge does not meet extended inspection interval requirements (SCBI < 5). An element inspection performed in past, but not updated at this time. <p style="text-align: right;"><i>Primary Inspection Type 7A03 = U</i></p>	NBI		24	<input type="checkbox"/>	
	Fracture Critical	<input type="checkbox"/>	-1	<input type="checkbox"/>	
	Underwater	<input checked="" type="checkbox"/>	24	<input checked="" type="checkbox"/>	
	Other Special	<input checked="" type="checkbox"/>	12	<input type="checkbox"/>	
	Element	<input checked="" type="checkbox"/>	24	<input type="checkbox"/>	
	Note: Engineer-In-Charge required UW inspection due to water depth poor visibility through water that prevented direct observation of NAB & FAB.				
8. Routine inspection of 100' steel 4 chord truss overhead sign structure over highway. <ul style="list-style-type: none"> Built in 2000. IS10 Overall Condition = 8 Very Good. Element inspection - not applicable. <p style="text-align: right;"><i>Primary Inspection Type 7A03 = S</i></p>	NBI		72	<input checked="" type="checkbox"/>	
	Fracture Critical	<input type="checkbox"/>	-1	<input type="checkbox"/>	
	Underwater	<input type="checkbox"/>	-1	<input type="checkbox"/>	
	Other Special	<input type="checkbox"/>	-1	<input type="checkbox"/>	
	Element	<input type="checkbox"/>	-1	<input type="checkbox"/>	
9. Routine inspection of a state-owned, 60' long P/S concrete spread box beam bridge carrying a highway over a stream. <ul style="list-style-type: none"> Bridge meets all criteria for extended inspection interval as outlined in Pub 238 Table 2.3.2.4-1. Substructure units can be inspected by wading and probing. An element inspection was required and performed. <p style="text-align: right;"><i>Primary Inspection Type 7A03 = R</i></p>	NBI		48	<input checked="" type="checkbox"/>	
	Fracture Critical	<input type="checkbox"/>	-1	<input type="checkbox"/>	
	Underwater	<input type="checkbox"/>	-1	<input type="checkbox"/>	
	Other Special	<input type="checkbox"/>	-1	<input type="checkbox"/>	
	Element	<input checked="" type="checkbox"/>	48	<input checked="" type="checkbox"/>	

Examples of Coding for Items 7A03, 7A06, 7A07, and 7A09 (cont.):

Examples for Coding Scheduling and Compliance Data including: 7A03, 7A06, 7A07, and 7A09		Compliance Inspection Type	7A07 Insp Req'd	7A09 Insp Freq	7A06 Insp Perf'd
10. Inspection of completed repairs to stringer ends of 120' long GFS, local, non-NHS bridge. <ul style="list-style-type: none"> • Bridge does not meet extended inspection interval requirements (Local Bridge). • Inspection was done 3 months after last Other Special (Interim) and 9 months before next NBI. • Bridge closed for repairs – this inspection is needed to verify repair has made bridge safe to re-open. • Repair consisted of reinforcing deteriorated web of several stringers with steel plates at both ends of main girder (under expansion dam). Re-rating required. • An element inspection is not required. <p style="text-align: right;"><i>Primary Inspection Type 7A03 = P</i></p>	NBI		24	<input type="checkbox"/>	
	Fracture Critical	<input checked="" type="checkbox"/>	12	<input type="checkbox"/>	
	Underwater	<input type="checkbox"/>	-1	<input type="checkbox"/>	
	Other Special	<input checked="" type="checkbox"/>	12	<input type="checkbox"/>	
	Element	<input type="checkbox"/>	-1	<input type="checkbox"/>	
Note: FC inspection not checked for 7A06 because repairs were to non-FCMs.					
11. Initial inspection of a posted, local, NHS, pony truss bridge after its superstructure has been replaced. <ul style="list-style-type: none"> • Bridge does not meet extended inspection interval requirements (Bridge must receive an Initial and one Routine separated by 24 months in order to qualify). • The new superstructure is a multi-girder P/S beam type with no load posting. • Prior to rehab, the 7A07 box would have been checked for Fracture Critical and Other Special (Interim) with 12-month frequencies in 7A09. • The 7A07 and 7A09 data has been revised for the new super. • The BRKEY for the original bridge structure will be maintained. Inventory items are reviewed and updated. This inspection is needed to verify substantive repair has made bridge safe to re-open. • Initial inspection (7A03 = F) done prior to re-opening – used to record changes in inventory data. • An element inspection was required and performed. • Posting lifted as result of rehab. Fracture Critical and Other Special (Interim) inspections no longer required. <p style="text-align: right;"><i>Primary Inspection Type 7A03 = F</i></p>	NBI		24	<input checked="" type="checkbox"/>	
	Fracture Critical	<input type="checkbox"/>	-1	<input type="checkbox"/>	
	Underwater	<input type="checkbox"/>	-1	<input type="checkbox"/>	
	Other Special	<input type="checkbox"/>	-1	<input type="checkbox"/>	
	Element	<input checked="" type="checkbox"/>	24	<input checked="" type="checkbox"/>	
Note: Prior to rehab, 7A07 FC box and OS box would have been checked to indicate old super was FC and posted. New super is not FC and will not be posted, so unchecked 7A07 FC and OS is correct after rehab. Update of inventory data by inspection reviewer will require un-checking the 7A07 FC and OS boxes and changing 7A09 FC and OS = -1. The above inspector codes for 7A06 to reflect inspection performed <u>after</u> rehab.					
12. Inspection of a state-owned, steel multi-girder bridge with an SCBI = 2, requiring an Other Special (Interim) Inspection due to undermining of the Near Abutment with a water depth of 6'. <ul style="list-style-type: none"> • Bridge does not meet extended inspection interval requirements (SCBI < 5 and Substructure Condition Code < 6). • The bridge requires an underwater inspection by divers due to the water depth. • The substructure is in CRITICAL condition. • Serious undermining of the Near Abutment was recorded by the divers. • The bridge will continue to require a reduced frequency inspection of the Near Abutment until repairs are made. • An element inspection performed in past, but not updated at this time. <p style="text-align: right;"><i>Primary Inspection Type 7A03 = U</i></p>	NBI		24	<input type="checkbox"/>	
	Fracture Critical	<input type="checkbox"/>	-1	<input type="checkbox"/>	
	Underwater	<input checked="" type="checkbox"/>	6	<input checked="" type="checkbox"/>	
	Other Special	<input checked="" type="checkbox"/>	6	<input checked="" type="checkbox"/>	
	Element	<input checked="" type="checkbox"/>	24	<input type="checkbox"/>	

Examples of Coding for Items 7A03, 7A06, 7A07, and 7A09 (cont.):

Examples for Coding Scheduling and Compliance Data including: 7A03, 7A06, 7A07, and 7A09		Compliance Inspection Type	7A07 Insp Req'd	7A09 Insp Freq	7A06 Insp Perf'd
13. Damage inspection of a state-owned, steel, multi-girder structure, with impact damage to a fascia girder. <ul style="list-style-type: none"> Fascia girder struck by an overheight vehicle. The impact damaged caused a tear in the girder. The ends of the tear have been clearly marked to monitor for future growth. The owner has determined a reduced interval is required to monitor the size of the tear. Bridge does not meet extended inspection interval requirements (Reduced interval required). The 7A06, 7A07, and 7A09 Other Special boxes have been checked and a frequency has been entered in 7A09 Other Special to show a more frequent inspection interval is required and has been started with this inspection. An element inspection performed in past, but not updated at this time. <p style="text-align: right;"><i>Primary Inspection Type 7A03 = B</i></p>	NBI		24	<input type="checkbox"/>	
	Fracture Critical	<input type="checkbox"/>	-1	<input type="checkbox"/>	
	Underwater	<input type="checkbox"/>	-1	<input type="checkbox"/>	
	Other Special	<input checked="" type="checkbox"/>	6	<input checked="" type="checkbox"/>	
	Element	<input checked="" type="checkbox"/>	24	<input type="checkbox"/>	
14. Other Special (Interim) inspection of a state-owned, 40' long multi-steel girder bridge with a steel open grid deck carrying a highway over a stream. <ul style="list-style-type: none"> Deck is in POOR condition; superstructure and substructure are in FAIR condition. Bridge meets reduced frequency of inspection requirements (Deck condition < 5 for steel open grid deck). Substructure units can be inspected by wading and probing. An element inspection performed in past, but not updated at this time. <p style="text-align: right;"><i>Primary Inspection Type 7A03 = I</i></p>	NBI		24	<input type="checkbox"/>	
	Fracture Critical	<input type="checkbox"/>	-1	<input type="checkbox"/>	
	Underwater	<input type="checkbox"/>	-1	<input type="checkbox"/>	
	Other Special	<input checked="" type="checkbox"/>	12	<input checked="" type="checkbox"/>	
	Element	<input checked="" type="checkbox"/>	24	<input type="checkbox"/>	
15. Routine inspection of a state-owned, 22' long metal arch culvert carrying a highway over a stream. <ul style="list-style-type: none"> Culvert is in SERIOUS condition. Culvert meets reduced frequency of inspection requirements (Culvert Condition < 4 and 6A29 = 30, 32, 33, or 35). Culvert can be inspected by wading and probing. An element inspection is required and performed. <p style="text-align: right;"><i>Primary Inspection Type 7A03 = R</i></p>	NBI		24	<input checked="" type="checkbox"/>	
	Fracture Critical	<input type="checkbox"/>	-1	<input type="checkbox"/>	
	Underwater	<input type="checkbox"/>	-1	<input type="checkbox"/>	
	Other Special	<input checked="" type="checkbox"/>	6	<input checked="" type="checkbox"/>	
	Element	<input checked="" type="checkbox"/>	24	<input checked="" type="checkbox"/>	

***7A10 Next Dt - Next Inspection Date** 

Inspection > Ratings & Schedule; Form P > Next Inspection

Description:

This series of five fields is used to record the date of the next required inspection by type of inspection.

Procedure:

This data should be reviewed prior to the inspection and reviewed after the inspection for any necessary revisions for future inspections.

Enter the date of the next required inspection relative to the current inspection shown for the selected structure. This date may be entered directly or calculated by the system by pressing the calculate button to the right of the "Next Inspection Date" label. For the calculate button to forecast the correct date, the scheduling data in fields 7A06, 7A07, 7A08, and 7A09 must be accurate.

For non-bridge structures, the 7A10 NBI value is also to be entered into the next inspection date data field for each type of structure: Sign structures in IS14, high mast light poles in IS14, and walls in IW14.

Coding:

Next inspection date for each inspection type.

7A11 Next Team Lead - Next Team Leader

Inspection > Ratings & Schedule

Description:

This item is used to record the team leader assigned to the next scheduled inspection of the structure.

Procedure:

Select the name of the team leader assigned to the next scheduled inspection of the structure from the dropdown list.

Coding:

Name of the team leader assigned to the next scheduled inspection of the structure.

7A12 NBI Crew Hours - NBI Inspection Crew Hours

Inspection > Ratings & Schedule; Form P > Next Inspection

Description:

This item is used to record the number of man-hours needed to perform the NBI inspection of the bridge.

Procedure:

Enter the number of man-hours expended for the field inspection of the bridge. This item includes the total time for inspection of the bridge, including the following items:

- field inspection time.
- travel time incurred for the inspection.
- number of man-hours expended for rigging the bridge for inspection.
- number of man-hours expended to perform the office work associated with the inspection.

Coding:

The number of man-hours, to the nearest hour.

Example:

A 2 man bridge inspection team spends 6 hours (each) traveling and inspecting a bridge, and an additional 2.6 hours (total) performing follow-up work in the office. In addition, 10 man-hours were expended rigging the bridge for inspection.

Coding:

12 hrs (travel and inspection)
 + 2.6 hrs (office work)
 + 10 hrs (rigging)
 = 24.6 Total Hours

25

7A13 Crane Hours - Bridge Inspection Crane Hours

Inspection > Ratings & Schedule; Form P > Next Inspection

Description:

This item is used to record the number of hours of use of a bridge inspection crane during the inspection of a bridge.

Procedure:

Enter the number of hours which a bridge inspection crane was used. Include travel time required, not counting time lost due to weather or breakdown. If a crane was not used, leave blank.

Coding:

The number of hours, to the nearest hour.

7A14 Next Insp By - Next Inspection Performed By

Inspection > Ratings & Schedule; Form P > Next Inspection

Description:

This item indicates the agency or Department Inspection Team assigned to perform the next inspection of the bridge.

Procedure:

Enter the code that describes the agency assigned to perform the inspection of the bridge. If it will be performed by a Department Inspection Team, a letter may be used to define the specific team. Code this item only if the Agency Submitting (6A06) has agreed to perform the next inspection.

Coding:

- A-Z Letter assigned by District to individual Department Force Inspection Team
- 1 Pennsylvania Department of Transportation (codes A-Z may be used instead)
- 2 County
- 3 City, Borough, Township
- 4 Pennsylvania Turnpike Commission
- 5 Delaware River Joint Toll Bridge Commission
- 6 Other State Agency
- 7 Railroad
- 8 Consulting Firm (Department bridges only)
- 9 Other (includes Federal Agency)
- Blank No commitment on the next inspection

Examples:

The Department will perform next inspection:

Municipality wants Department to perform next inspection:

County has agreed to inspect its own bridge:

County coordinating inspection of City, Borough, or Township bridge:

City, Borough, or Township agreed to inspect its own bridge:

No commitment for next inspection:

7A15 Frac Crit Hours - Fracture Critical Inspection Hours

Inspection > Ratings & Schedule; Form P > Next Inspection

Description:

This item is used to record the number of man-hours needed to perform the fracture critical inspection of the bridge.

Procedure:

Enter the number of man-hours expended for the field inspection of the bridge. This item includes the total time for inspection of the bridge, including the following items:

- field inspection time
- travel time incurred for the inspection.
- number of man-hours expended for rigging the bridge for inspection.
- number of man-hours expended to perform the office work associated with the inspection.

Coding:

The number of man-hours, to the nearest hour. See item 7A12 for an example.

7A16 Other 1 Hours

Form P > Next Inspection

Description:

This item is used to record the number of other hours required for inspection of a structure, which are not accounted for in other fields.

Procedure:

Enter the number of hours required for inspection of the structure, which are not accounted for in other fields.

Coding:

The number of hours, to the nearest hour.

7A17 UWater Hours - Underwater Inspection Hours

Inspection > Ratings & Schedule; Form P > Next Inspection

Description:

This item is used to record the number of man-hours needed to perform the underwater inspection of the bridge.

Procedure:

Enter the number of man-hours expended for the field inspection of the bridge. This item includes the total time for inspection of the bridge, including the following items:

- field inspection time
- travel time incurred for the inspection.
- number of man-hours expended for rigging the bridge for inspection.
- number of man-hours expended to perform the office work associated with the inspection.

Coding:

The number of man-hours, to the nearest hour. See item 7A12 for an example.

7A18 Other 2 Hours

Form P > Next Inspection

Description:

This item is used to record the number of other hours required for inspection of a structure, which are not accounted for in other fields.

Procedure:

Enter the number of hours required for inspection of the structure, which are not accounted for in other fields.

Coding:

The number of hours, to the nearest hour.

7A19 Extended Inspection Interval Eligibility

Inspection > Ratings & Schedule; Form P > Next Inspection

Description:

This item is an internally calculated item that returns a "Yes" if the bridge qualifies for an extended inspection interval of 48 months. The field will display "No" if the bridge does not qualify.

Procedure:

This item is automatically calculated by the system.

Coding:

N - Not Applicable	Structure type is not eligible for extended interval inspections (Tunnels, Signs, Walls, Lights)
0 - No	Bridge is not eligible for extended interval inspections
1 - Yes	Bridge is eligible for extended interval inspections
2 - Yes, Except Owner Type	Bridge meets all eligibility criteria for extended interval except owner type (not PennDOT or Turnpike owned and NBIS length)

7A20 Extended Inspection Interval Concurrence

Inspection > Ratings & Schedule; Form P > Next Inspection

Description:

This item indicates if the owner concurs with use of the Extended Inspection Interval of 48 months.

Procedure:

Select "Yes" if the owner agrees to allow the use of an Extended Inspection Interval of 48 months. Select "No" if the owner does not want the bridge to be inspected at an Extended Inspection Interval of 48 months. This value can only be changed by the District Bridge Unit Poweruser (one per District) or Central Office on behalf of the Pennsylvania Turnpike Commission.

Coding:

- N - Not Applicable Structure type is not eligible for extended interval inspections (Tunnels, Signs, Walls, Lights)
- 0 - No The bridge owner does not concur with extended inspection interval or the bridge is not eligible
- 1 - Yes The bridge owner concurs with extended inspection interval

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VP Inventory - Posting

The Inventory - Posting screen is used to enter and display information related to the posted status of a bridge. This screen will capture the posting history of the structure.

By default, the posting tab will display all records for a selected bridge in a tabular form, starting from the most recent posting data. The records can be sorted for each column by clicking on the desired column heading. Clicking on the column heading a second time will sort the records in descending order.

A user may only enter a new posting. Modifications to an existing posting must be done by the BMS2 Manager. New posting information can be added using the "Create" button (green button next to Action heading). When new posting information is created, the current posting record, if it exists, becomes a part of the posting history for the structure and cannot be edited. No past posting information can be removed.

VP01 Status Date

Inventory > Posting > Posting Detail; Form K > Posting

Description:

This item is used to record the date that the corresponding posting status became effective.

Procedure:

Enter the date that the corresponding posting status became effective. If an exact date is not known, provide a best estimate.

Note:

For bridges requiring a posting change based on a revised rating, the bridge posting must be installed or revised within 30 days of the IR02 date. Therefore, the VP01 status date must be within 30 days of the IR02 calculation date.

Coding:

Date that the corresponding posting status became effective in MM/DD/YYYY format.

*VP02 Posting Status

Inventory > Posting > Posting Detail; Form K > Posting

Description:

This item provides information about the actual operational status of a structure. The field review could show that a structure is posted, but data item 4B03, Bridge Posting, may indicate that posting is not required. This is possible and acceptable coding since item 4B03 is based on the operating stress level and the governing agency's posting procedures may specify posting at some stress level less than the operating rating.

Coding:

Select a code for all structures from the dropdown menu.

- A Open, no restrictions – includes sign structures.
- *B Open, posting recommended but not legally implemented (all weight restriction signs including advance warning signs, etc., not in place). Legal posting must be implemented within 30 days of the date of the B posting. The B posting date should match the IR02 date.
- C(K) Bridge closed to all traffic; must also complete data item VP01.
- D Open, would be posted or closed except for temporary shoring, etc., to allow for unrestricted traffic.
- E Open, temporary structure in place to carry legal loads while original structure is closed and awaiting replacement or rehabilitation.
- G New structure not yet open to traffic.
- P Posted for load (may include other restrictions); must also complete Item VP01.
- R Posted for other load capacity restrictions (speed, number of vehicles on bridge, etc.).
- X Bridge has been demolished/replaced.

Notes:

If codes C, P or R are selected, items VP01, VP03, VP04, VP05, and VP06 on the Inventory Posting (VP) screen shall be completed.

If 4B03 (Posting) \leq 4 and signing is correct, VP02 must be C, P, R or B. Code appropriate weight limits in Items VP04 and VP05 on the Inventory Posting (VP) screen.

If code X is selected, Fields 5A17 (Type of Service On), 5A21 (Owner), 6A12 (Demolished/Replaced Indicator), and 6A13 (Demolished/Replaced Date) will also be changed to match the demolished/replaced status of the structure.

*B is an interim code for pending posting only. DO NOT code B where proper posting was once completed, but signs are now missing or vandalized. For missing or vandalized posting signs or wrong signs:

- Priority code – 0
- 4A01 (not B), C, P or R
- Immediately contact owner
- Follow-up on corrective action

Example:

- A bridge is inspected on April 15 and the need to update the load rating is identified.
- The load rating is updated, approved, sealed, and the rating set is uploaded into BMS2. The rating set is assigned to the current inspection on June 6 to match the date the rating was sealed (within the required 60 days from the inspection date). This will automatically set the IR02 date to June 6. The revised load rating identifies the need for a load posting.
- The Bridge Posting Recommendation Data Sheets are filled out and the necessary approvals are obtained.
- The VP02 posting status is changed to B to indicate a posting is recommended but not legally implemented. The VP01 status date is set to June 6 to match the IR02 date.
- The owner installs the new signs on June 28. The VP02 posting status is changed to P with the appropriate posting values. The VP01 status date is set to June 28 (within the required 30 day timeframe).

VP03 Special Restrictive Posting

Inventory > Posting > Posting Detail; Form K > Posting

Description:

This item is used to record the type of special restrictive posting for the bridge.

Procedure:

Select the code from the dropdown list that describes the type of special restrictive posting for the bridge.

Coding:

- 0 Not applicable
- 1 Bridge limited to one truck (without weight limits)
- 2 Bridge limited to one truck (with weight limits)

Note:

In the old BMS if this item was coded "1", users were to enter "LL" (legal load) in Weight Limit and Combination, items VP04 and VP05. This is no longer applicable in BMS2.

VP04 Posted Weight Limit

Inventory > Posting > Posting Detail; Form K > Posting

Description:

This item is used to record the posted weight limit for the bridge.

Procedure:

This item should be completed for a bridge, which has been designated as posted by entering a "B" or "R" in item VP02. This item is required when the posting status is "P".

Note:

The old BMS had users enter "LL" for bridges posted for one truck without weight restrictions. This is no longer applicable in BMS2.

Coding:

The load limit in tons. Prefix with zeros where necessary.

- ZZ Posting pending, sign installation order issued (Old BMS only)
- LL If item VP03, SPEC LMT, is coded "1" (Old BMS only)
- Blank Not posted

VP05 Posted Limit Combination

Inventory > Posting > Posting Detail; Form K > Posting

Description:

This item is used to record the posted load combination limit for the bridge.

Procedure:

This item should be completed for a bridge, which has been designated as posted by entering a "B" or "R" in item VP02. This item is required when the posting status is "P".

Note:

The old BMS had users enter "LL" for bridges posted for one truck without weight restrictions. This is no longer applicable in BMS2.

Coding:

The load limit in tons. Prefix with zeros where necessary.

ZZ Posting pending, sign installation order issued (Old BMS only)
 LL If item VP03, SPEC LMT, is coded "1" (Old BMS only)
 Blank Not posted

VP06 Posting Reason - Reason for Posting or Closing the Bridge

Inventory > Posting > Posting Detail; Form K > Posting

Description:

This item indicates the reason why the bridge was posted or closed.

Procedure:

Select the appropriate code from the dropdown list which indicates the primary reason the bridge was posted or closed. This field is required when the posting status is "P" or "C(K)".

Note:

"Phrases" used primarily in communication with the State Police (BD 78-17).

Coding:

A Deck condition rating ("deficient deck")
 B Superstructure condition rating ("main bridge members overstressed")
 C Superstructure condition rating ("deficient main bridge members")
 D Superstructure condition rating ("deficient secondary bridge members are overstressed")
 E Substructure condition rating ("deficient substructures - piers")
 F Substructure condition rating ("deficient substructures - abutment")
 G Combination of A to D
 H Combination of E and F
 I Combination of G and H
 J Structure condition appraisal rating. This applies to a bridge posted because the design load was less than HS20. ("deficient main bridge members")
 K Combination of one or more of above
 L Bridge washed out or damaged by flood flow or vehicular accident
 M Existing or new bridge under construction
 N Adjacent construction

VP07 Field Conditions

Inventory > Posting > Posting Detail

Description:

This item indicates the field conditions which may influence the determination of load limits for a posted bridge.

Procedure:

If field conditions influence the determination of load limits for a posted bridge, select the appropriate code from the dropdown list.

Coding:

- 0 Not applicable
- 1 Traffic signal or stop sign (trucks may follow each other too closely, or trucks may occupy more than one lane)
- 2 Rough approaches (could create impact higher than allowed in design)
- 3 Steep grade (influence speed or traffic)
- 4 Alignment (alignment is such that causes trucks to follow too closely to each other)
- 5 Combination of 1, 2, 3, or 4

VP08 Special Conditions

Inventory > Posting > Posting Detail

Description:

This item indicates the special conditions which may influence the determination of load limits for a posted bridge.

Procedure:

If special conditions influence the determination of load limits for a posted bridge, select the appropriate code from the dropdown list.

Coding:

- 0 Not applicable
- 1 Bridge near industrial plant
- 2 Bridge near quarry, mine, ready mix plant, bulk cargo hauling pier, or similar
- 3 Bridge near a truck stop
- 4 Combination of 1, 2, and/or 3
- 5 Risk Based Posting

VP09 Impact

Inventory > Posting > Posting Detail

Description:

This field indicates whether or not the determination of load limits is influenced by the impact being lower or higher than permitted by the AASHTO Specifications.

Procedure:

Select the applicable code from the dropdown list.

Coding:

- 1 AASHTO Impact Factor
- 2 Lower than AASHTO Impact Factor
- 3 Higher than AASHTO Impact Factor

VP10 Permanently Closed Structure (District Use Only)

Inventory > Posting > Posting Detail

Description:

This item is used to indicate the structure is permanently closed. A permanently closed structure is defined as a structure that has no State and/or Planning Partner intent or need to restore any level of service in order to carry a highway at that location.

Procedure:

Check this box if the structure is permanently closed. This will distinguish permanently closed structures from structures where closure may be temporary. When this box is checked and the related "exclude permanently closed structure" filter box is checked on the Risk Score Search screen, permanently closed structures will not be included in the resulting Risk Score Structure List following a search. Similarly, the user will be able to exclude permanently closed structures from the Risk Score Crystal Report list of structures to be viewed by filtering the report content based on this field.

Coding:

- Unchecked Structure is open or closure is temporary
- Checked Structure is permanently closed

VA Inventory - Paint

The Inventory - Paint screen is used to enter and display information related to painting of steel structures.

By default, the paint history will be displayed in chronological order with the most recent application displayed first. The records can be sorted for each column by clicking on the desired column heading. Clicking on the column heading a second time will sort the records in descending order.

New paint history records can be added using the "Create" button (green plus sign). Existing records can be deleted by selecting one or more desired records from the list and clicking on the "Remove" button. A confirm deletion prompt will be displayed by the system before the records are removed. The "Save" button is used to commit pending changes on the screen, if any, to the database.

VA01 Date Applied - Date the Bridge Was Painted

Inventory > Paint > Paint Detail

Description:

This item is used to record the date the bridge was painted.

Procedure:

Enter the date on which the painting of the bridge was completed.

Coding:

The date on which the painting of the bridge was completed in MM/DD/YYYY format. Prefix with zeros where necessary.

VA02 Paint Extent - Extent of Paint Applied to the Structure

Inventory > Paint > Paint Detail

Description:

This item is used to record the extent of the paint applied.

Procedure:

Select the code that describes the extent of the painting from the dropdown list.

Coding:

- | | | | |
|---|--|---|--------------------|
| 1 | Entire bridge | 6 | Spot + <60% finish |
| 2 | Zone - 60% of steel surface are or more | 7 | Spot |
| 3 | Zone - 40% of steel surface are or more | 8 | Finish |
| 4 | Zone - 20% of steel surface area or more | 9 | Joint areas only |
| 5 | Spot + >60% finish | 0 | Reserved |

VA03 Steel - Tons of Steel Painted

Inventory > Paint > Paint Detail

Description:

This item is used to record the weight of steel painted.

Procedure:

Enter the number of tons of steel painted.

Coding:

Tons of steel.

VA04 Surface Area - Estimated Surface Area in Square Feet Requiring Painting 📄

Inventory > Paint > Paint Detail

Description:

This item is used to record the estimated surface area of the structure requiring painting.

Procedure:

Enter the surface area in thousands of square feet.

Coding:

Estimated surface area in square feet.

Example:

Estimated surface area is 5,676,000 square feet:

VA05 Primer - Type of Primer Coat Applied to the Structure 📄

Inventory > Paint > Paint Detail

Description:

This item is used to record the type of primer coat that was applied to the structure.

Procedure:

Select the type of primer coat applied to the bridge from the dropdown list.

Coding:

M Mastic
I Inorganic Zinc
O Organic Zinc
L Lead Base

VA06 Intermediate - Type of Intermediate Coat Applied to the Structure 📄

Inventory > Paint > Paint Detail

Description:

This item is used to record the type of intermediate coat that was applied to the structure.

Procedure:

Select the type of intermediate coat applied to the bridge from the dropdown list.

Coding:

M	Mastic	A	Acrylic
E	Epoxy	R	Chlorinated Rubber
V	Vinyl	P	Phenolics
U	Urethane	K	Alkyd

VA07 Finish - Type of Finish Coat Applied to the Structure

Inventory > Paint > Paint Detail

Description:

This item is used to record the type of finish coat that was applied to the structure.

Procedure:

Select the type of finish coat applied to the bridge from the dropdown list.

Coding:

M	Mastic	A	Acrylic
E	Epoxy	R	Chlorinated Rubber
V	Vinyl	P	Phenolics
U	Urethane	K	Alkyd

VA08 Paint Color - Color Number of Paint

Inventory > Paint > Paint Detail

Description:

This item indicates the color of the finish coat of paint used on the bridge.

Procedure:

Select the code from the dropdown list which indicates the color of the finish coat of the paint applied.

Coding:

01	Basic Lead Silico Chromate Ready Mixed Primer AASHTO M229-74 Type V	09	Antique Bronze
1R	Dull red primer	10	Green paint, semi-gloss
1Y	Zinc yellow primer	11	Black paint, gloss
02	Zinc dust - Zinc oxide primer	12	White paint, gloss
03	Yellow paint, flat or enamel	14	Black enamel
04	Blue paint, gloss or finish coat	15	Grey paint, gloss
05	White paint, flat	16	Red paint, semi-gloss
5G	White paint, pebble	17	Aztec Gold, semi-gloss
06	Black paint, semi-gloss	18	Azure Blue, gloss
07	High heat Black paint, gloss	19	Sea Mist Green, gloss
08	Sandstone paint	20	Aluminum paint
		99	Other miscellaneous paint products

VA09 Num Coats - Coats of Paint Applied

Inventory > Paint > Paint Detail

Description:

This item is used to record the number of coats of paint applied to the bridge.

Procedure:

Enter the number of coats of paint applied to the bridge.

Coding:

Number of coats of paint applied.

VA10 Thickness - Thickness of Paint Applied to the Structure

Inventory > Paint > Paint Detail

Description:

This item is used to record the thickness of the paint applied to the structure.

Procedure:

Enter the average dry film thickness (mils) of paint applied.

Coding:

The average dry paint film thickness in mils.

VA11 Paint Volume - Gallons of Paint Applied

Inventory > Paint > Paint Detail

Description:

This item is used to record the number of gallons of paint applied to the bridge.

Procedure:

Enter the number of gallons of paint applied to the bridge.

Coding:

Number of gallons of paint applied.

VA12 Cleaning Type - Type of Cleaning Used

Inventory > Paint > Paint Detail

Description:

This item indicates the type of cleaning used on the bridge.

Procedure:

Select the code from the dropdown list which indicates the type of cleaning used.

Coding:

C	Commercial blast cleaning
S	Solvent cleaning
T	Power tool cleaning
W	Near white blast cleaning
O	Other

VA13 Paint Cost - Cost of Painting

Inventory > Paint > Paint Detail

Description:

This item is used to record the total cost of painting the bridge.

Procedure:

Enter the total cost of painting the bridge.

Coding:

Painting costs in millions of dollars.

VA14 Notes

Inventory > Paint > Paint Detail

Description:

This item is used to record any notes about the paint applied to the structure.

Procedure:

Enter any notes about the paint applied to the structure in narrative form.

Coding:

Users may include additional notes about the paint applied to the structure in narrative form that is not being captured by the other fields. Additional information may include the painting contractor, specific properties of the paint, etc.

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VM Inventory - Maintenance Responsibility

The Inventory - Maintenance Responsibility screen captures and displays information about parties responsible for maintaining various portions of a structure. These fields appear on the Structure Home screen.

There is a one to one correspondence between an agency and a PUC docket. If an agency changes its maintenance responsibility (including eliminating its responsibility), a new row is created on this screen. If a particular PUC docket involves multiple agencies, a separate row is created for each agency with each row containing the same PUC docket number. Agencies with multiple rows should be grouped together for display with the agency only appearing for the first row in the group.

Agency Responsible is a code controlled by FHWA. When an agency no longer has maintenance responsibility, PennDOT will use the "Other" code value and describe the changes in the notes. The Create button allows users to add Maintenance Responsibility records. Users may select one or more Maintenance Responsibility records and use the Remove button to remove the records. Users will be prompted by the system to confirm deletion before the records are removed. The Save button is used to commit pending changes on the screen, if any, to the database.

VM01 Legis Act Num - Legislative Act Number which Transferred Ownership

Inventory > Structure Home

Description:

This item is used to record the Legislative Act number which transferred ownership of the bridge to the Department of Transportation.

Procedure:

If the ownership of the bridge has been transferred to the Department of Transportation by Legislative Act, enter the number of the Act. Leave this item blank if ownership of the bridge has not been transferred to the Department by Legislative Act.

Coding:

The Legislative Act Number which transferred ownership of the bridge.

*VM02 Maint Resp Desc - Maintenance Responsibility for the Bridge

Inventory > Structure Home

Description:

This item is used to describe, in a narrative form, whom was responsible for maintenance of this bridge. It is used in conjunction with item MAINTENANCE CODE, VM03.

Procedure:

Enter the name(s) of the agency responsible for maintenance of the bridge. Abbreviations should be used where necessary, but an attempt should be made to keep them meaningful. (List in declining order of magnitude of maintenance responsibility).

Coding:

A narrative description of the agencies responsible for maintenance of the bridge. Abbreviations should be used where necessary, but an attempt should be made to keep them meaningful.

Examples:

Assume a bridge is entirely maintained by the Pennsylvania Department of Transportation.

PA DOT

Assume the superstructure is maintained by the Pennsylvania Department of Transportation and the substructure is maintained by the Turnpike Commission.

PA DOT Super, PTC Sub

***VM03 Agency Responsible - Agency Responsible for Bridge Maintenance**

Inventory > Structure Home > Additional Maintenance Responsibility

Description:

This item indicates which agency is responsible to maintain what portion of the bridge. This item is used in conjunction with items VM04, VM05, and VM06.

Procedure:

As many entries as required may be made to describe who is responsible to maintain what portion of the bridge. Select the appropriate entry from the dropdown list.

Coding:

- | | |
|--|--|
| 01 State Highway Agency | 31 State Toll Authority |
| 02 County Highway Agency | 32 Local Toll Authority |
| 03 Town or Township Highway Agency | 60 Other Federal Agencies (not listed below) |
| 04 City, Municipal Highway Agency or Borough | 62 Bureau of Indian Affairs |
| 11 State Park, Forest or Reservation Agency | 64 U.S. Forest Service |
| 12 Local Park, Forest or Reservation Agency | 66 National Park Service |
| 21 Other State Agencies | 68 Bureau of Land Management |
| 25 Other Local Agencies | 69 Bureau of Reclamation |
| 26 Private (other than Railroad) | 70 Military Reservation Corps of Engineers |
| 27 Railroad | 80 Unknown |

***VM04 Portion - Portion of Bridge**

Inventory > Structure Home > Additional Maintenance Responsibility

Description:

This item indicates the portion of the bridge for which the Agency identified in item VM03 is responsible. This item is used in conjunction with items VM03, VM05, and VM06.

Procedure:

Select the appropriate entry from the dropdown list that corresponds to the portion of the bridge for which the Agency identified in item VM03 is responsible.

Coding:

- | | | | |
|---|--|---|--|
| 1 | Entire structure including roadway surface | 6 | Combination of 7 and 8 |
| 2 | Entire structure excluding roadway surface | 7 | Roadway surfaces (includes deck and wearing surface) |
| 3 | Superstructure including roadway surface | 8 | Sidewalks and/or curbs and/or railings |
| 4 | Superstructure excluding roadway surface | 9 | Other |
| 5 | Substructure | 0 | Mixed responsibility |

VM05 PUC Docket Num - PUC Docket Number

Inventory > Structure Home > Additional Maintenance Responsibility

Description:

This optional item is used to record the PSC-PUC Docket Number when the PSC-PUC has jurisdiction over the bridge involved. This item is used in conjunction with items VM03, VM04, and VM06.

Procedure:

Enter the most important/use PUC Order PSC-PUC Docket Number, either A__ or C__ when the PUC has jurisdiction over the structure involved.

Coding:

PSC-PUC Docket Number.

VM06 Order Date - PUC Order Date

Inventory > Structure Home > Additional Maintenance Responsibility

Description:

This item is used to record the date the PUC order became effective. This item is used in conjunction with items VM03, VM04, and VM05.

Procedure:

Enter the date the PUC order became effective.

Coding:

Date the PUC order became effective in MM/DD/YYYY format.

VM07 Notes

Inventory > Structure Home > Additional Maintenance Responsibility

Description:

This item is used to record additional information about the maintenance responsibility for the bridge, especially in cases where responsibility is "mixed".

Procedure:

Enter any additional information about the maintenance responsibility for the bridge in narrative form.

Coding:

Additional information about the maintenance responsibility for the bridge in narrative form.

Example:

For a structure where PennDOT maintains 4 spans and a railroad maintains the remaining 2 spans, there will be two records with the Description field set to Miscellaneous Responsibility. In this case, the Note field can be used to specify how the responsibility is distributed among the two parties.

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VD Inventory - Design

The Inventory - Design screen allows a user to enter additional information for a structure related to the design of the structure. The screen under the Inventory Links.

Fields that contain repeating values (e.g., Design Exception Codes, Steel Types, Bearing Types, etc.) are shown in plain list boxes, with no limits to the maximum number of items that can be added to these lists. To add items to a list, use the Add Item button corresponding to that list. This will display an Add Item dialog to allow user to input data specific to the list. To remove items, select one or more items (use Ctrl + Click to select multiple items), and use the Delete Item(s) button. Users will be prompted by the system to confirm deletion before the records are removed. The Save button is used to commit pending changes on the screen, if any, to the database.

VD01 Design Method

Inventory > Design

Description:

This item indicates whether Service Load Design, Load Factor Design, or Load and Resistance Factor Design (LRFD) was the method used in the design of the bridge.

Procedure:

Select the code from the dropdown list that describes the method of design used. If this information is not available, leave this item blank.

Coding:

S	Service Load Design
L	Load Factor Design
R	LRFD
Blank	Unknown

VD02 Live Load Continuity - Beams Designed for Live Load Continuity?

Inventory > Design

Description:

This item indicates whether or not continuity for the live load was incorporated in the design of the prestressed beam.

Procedure:

If the continuous live load design method was used, enter a code of "1". If the continuous live load design method was not used, enter a code of "0". For single span prestressed or non-prestressed bridges, this item may be left blank.

Coding:

0	Continuous live load design method was not used
1	Continuous live load design method was used
2	Continuity for live load was incorporated in the retrofit or rehabilitation of the bridge

Note:

In keeping with the philosophy of DM4, Section D 5.14.1.2.7a, the bridge rating should be based on the more critical condition of full continuity or as a simple span assuming complete loss of continuity.

VD03 Geometry - Geometry of Main Beams or Girders

Inventory > Design

Description:

This item indicates the geometry of the main beams or girders of a bridge.

Procedure:

Enter the code that describes the geometry of the main beams or girders of a bridge.

Coding:

- | | | | |
|---|------------------------------|---|---------------------------------|
| 1 | Straight | 5 | Combination of 1 and 3 above |
| 2 | Curved | 6 | Combination of 2 and 3 above |
| 3 | Straight with angled splice | 7 | Combination of 1, 2 and 3 above |
| 4 | Combination of 1 and 2 above | | |

VD04 Steel Beam Splice - Type of Field Splice Used for Steel Beams

Inventory > Design

Description:

This item indicates the type of field splice used for steel beam bridges.

Procedure:

Enter the code that describes the type of field splice used for steel beam bridges. A combination of the type splice should be coded as "9 - Other".

Coding:

- | | |
|---|---------|
| 1 | Welded |
| 2 | Bolted |
| 3 | Riveted |
| 9 | Other |

VD05 Steel Types - Types of Steel & Other Metals Used in Bridge Members

Inventory > Design

Description:

This item is used to record the types of steel used in the fabrication of main steel bridge members such as beams, girders, trusses, etc.

Procedure:

List in order of structural importance.

Code using the designation shown in the design drawings.

Coding:

STRUCTURAL STEELS

	Old ASTM	New ASTM	'92 AASHTO	Description
01	A7	Not used in new bridge construction		Carbon
02	A36	A709 Gr. 36	M290 Gr. 36	Carbon
03	A242	Not used in new bridge construction		Weathering
04	A440	Not used in new bridge construction		High Strength Low Alloy
05	A441	Not used in new bridge construction		High Strength Low Alloy
06	A588	A709 Gr. 50W	M270 Gr. 50W	Weathering
07	A572	A709 Gr. 50	M270 Gr. 50	High Strength Low Alloy
08	A514/ A517	A709 Gr. 100	M270 Gr. 100	High Fy, Quenched & Tempered
09	A94	Not used in new bridge construction		Silicon
10	A8	Not used in new bridge construction		Nickel
14		A709 Gr. 70	M270 Gr. 70	
15	A709	A709 Gr. HPS 70W	M270 Gr. HPS 70W	High Performance Steel

OTHER METALS

- 11 Wrought Iron
- 12 Aluminum
- 13 Cast Iron
- 16 Galvanized Steel (for HMLP)
- 99 Other

VD06 Vacuum Process - Were the Prestressed Girders Cured by Vacuum Process?

Inventory > Design

Description:

This item indicates whether or not the vacuum process for concrete curing was used on the prestressed girders.

Procedure:

If the concrete girders were cured by vacuum process, select "1". If the concrete girders were not vacuum processed, select "0".

Coding:

- 0 Vacuum process was not used
- 1 Vacuum process was used

VD07 Strand Type - Are the Strands Straight or Draped?

Inventory > Design

Description:

This item indicates if the prestressing strands used in the prestressed girders are straight or draped.

Procedure:

For bridges with prestressed girders, select the code which indicates whether straight, draped, or both straight and draped strands were used in the prestressed girders.

Coding:

- 1 Straight strands
- 2 Draped strands
- 3 Both straight and draped strands
- 4 Debonding (other than to reduce stress concentration at beam end)
- 5 Debonding (as per 4) plus draped strand

VD08 Comp Strength @ 28 days - Compressive Strength of Beam Concrete at 28 Days

Inventory > Design

Description:

This is a 5 digit field used to record the specified compressive strength of the beam concrete at 28 days.

Procedure:

For bridges with prestressed girders, enter the specified compressive strength of beam concrete at 28 days.

Coding:

The specified compressive strength in pounds per square inch (psi). If more than one strength of concrete is used, code "99999".

VD09 Comp Strength @ release - Compressive Strength of Beam Concrete at Release

Inventory > Design

Description:

This is a 5 digit field used to record the specified compressive strength of the beam concrete at the time of initial prestress (release).

Procedure:

For bridges with prestressed girders, enter the specified compressive strength of the beam concrete at the time of initial prestress (release).

Coding:

The specified compressive strength in pounds per square inch (psi). If more than one strength of concrete is used, code "99999".

VD10 Prestressed Splice Type - Type of Field Splice Prestressed Girders

Inventory > Design

Description:

This series of three fields indicate the type of joints (field splice) in prestressed concrete girders, segmental post tensioned girders, etc. Examples are transverse joints in segmental box girders, splice joints in long prestressed I-girders, joints in drop-in spans, post-tensioned pier caps or in beams at continuity points over piers.

Procedure:

For bridges with prestressed concrete girders, enter the code that indicates the type of joint (field splice) used. Leave blank or “_” for non-prestressed beams.

Coding:

Design	Filler	Through
0 Not applicable	0 Not applicable	0 Not applicable
1 Butt joint	1 Dry joint	1 Mild spliced reinforcing thru joints
2 Butt joint with single large key	(no fill material)	2 Tendon thru joint
3 Butt joint with multiple small keys	2 Mortar joint filler	3 Additional diagonal tendons thru joint
4 Spaced joint (butt)	3 Epoxy joint filler	4 Mechanical splice thru joint
5 Spaced joint (with single large key)	4 Concrete joint filler	5 Acts as a hinge as in drop-in spans
6 Spaced joint (with multiple small keys)	5 Other	6 Cad weld splice thru joint
7 Open joint with single large key		7 Combination of above
8 Other joint		8 Other

VD11 Design Tension Method - Prestressed Design Tensioning Method

Inventory > Design

Description:

This series of three fields indicate the design tensioning method(s) used for a bridge with prestressed girders.

Procedure:

For bridges with prestressed girders, select the code(s) from the dropdown list, which describe the design tension method(s) used on the prestressed girders. Up to 3 design tensioning method codes may be entered.

The 1st field is used to enter the code for the first design tensioning method. The 2nd field is used to enter the code for the second design tensioning method, etc. Code zero if not applicable.

Coding:

- 0 Not Applicable
- 1 Pretensioned
- 2 Post Tensioned
- 3 Pre-Post Tensioned

VD12 Void Type

Inventory > Design

Description:

This item indicates the type of voids in the prestressed girders of a bridge.

Procedure:

For bridges with prestressed girders, enter the code(s) which describe the type(s) of voids in the girders.

If there are no voids in the prestressed girders, code zero.

Coding:

- 0 No void
- 1 Rectangular void
- 2 Special void
- 3 Twin circular void
- 4 Singular circular void

VD13 Strand Sizes - Size of Prestressed Strands

Inventory > Design

Description:

This item indicates the size(s) of strand used on bridges with prestressed girders.

Procedure:

For bridges with prestressed girders, enter the code(s), which describe the size of strand used in the prestressed girders.

Coding:

- 1 5/16" diameter strands or smaller
- 2 3/8" diameter strands
- 3 7/16" diameter strands
- 4 1/2" diameter strands
- 5 0.6 " diameter strands
- 6 1/2" special diameter strands
- A 7/16" coated strands
- B 1/2" coated strands

VD14 Abutment Type

Inventory > Design

Description:

This two part item indicates the type of abutment at both the near and far ends of the bridge. Refer to the definition of Direction and Orientation for an explanation on determining near and far ends.

Procedure:

This item is divided into 2 parts to allow for the entering of both ends of the bridge. Select the appropriate code from the dropdown list for each abutment.

Notes:

Code "B" if piles are used on VSL or RE.

Underscoring denotes a proprietary product.

Codings X, Y, and Z are provided to describe field observable conditions. Use only when more detailed or exact plan information does not exist.

Coding:

- | | |
|---|---|
| 1 Stub | E Pile bent |
| 2 Cantilever | F Reserved |
| 3 Gravity Concrete | G Gabion |
| 4 Gravity Stone-masonry | H <u>VSL Retained Earth</u> - MSE |
| 5 Counterfort | I <u>Reinforced Earth</u> - MSE |
| 6 Integral | J <u>Doublewall</u> (concrete modular wall) |
| 7 Cellular | K Flexible anchored wall |
| 8 Spill-through Abutment | L Flexible non-anchored wall |
| 9 Other (describe in comments) | M Geosynthetic Retaining System Wall |
| A Reinforced concrete pad resting on mechanically stabilized embankment retaining wall | X Concrete unknown, cannot determine type |
| B Pile supported reinforced concrete pad behind face of mechanically stabilized embankment retaining wall | Y Concrete spill-through, sloping front face to channel flood flows |
| C Precast modular earth filled wall - concrete | Z Mechanically stabilized panels, cannot determine type |
| D Other proprietary | |

Examples:

- RC Cantilever:
- Pile supported pad on VSL wall:
- Tied back soldier beam wall:

VD15 Abutment Foundation Type

Inventory > Design

Description:

This two part item indicates the type of abutment foundation at both the near and far ends of the bridge. Refer to the definition of Direction of Orientation for an explanation on determining near and far ends.

Procedure:

This item is divided into 2 parts to allow for the entering of the type abutment foundation code at both ends of the bridge. Select the appropriate code from the dropdown list for each abutment.

A coding of blank is not permitted for this item.

Notes:

This coding system is also used in items VD17 and IN13.

Codings of R and S are provided to describe field observable conditions. Use only when more detailed or exact plan information does not exist.

Coding:

A	Footing on competent bedrock*	K	Footing or culvert with an integral bottom on erodible bedrock (such as claystone, clay shale, silt stone, shale or weathered bedrock)
B	Cast-in-place concrete piles	L	Footing and culverts with an integral bottom on soil (sand-gravel, cobbles, silt and clay)
C	precast concrete piles	O	Other (describe in item IN24, inspection notes)
D	Prestressed concrete piles	P	Foundation type has been researched; information is unknown or not available with confidence
E	Steel H-piles	R	Footing on bedrock - erodibility cannot be determined
F	Steel pipe piles or Micropiles	S	Pile or caissons, if determined by probing
G	Timber piles	X	Information is not available at this time
H	Drilled caisson		
I	Deep water caisson		
J	Pedestals		

*For scour purposes, good quality rock or competent bedrock is defined as rock with no significant ongoing erosion and a low risk of failure during an extreme event.

VD16 Pier Types - Pier Material and Configuration

Inventory > Design > Pier Type Detail

Description:

This item indicates the type(s) of piers used on a bridge.

Procedure:

This item is divided into 2 parts to allow for the entering of the pier material and the pier configuration. Select the appropriate code from the dropdown list for each pier.

Coding:

Material	Configuration
1 Timber	1 Single Column
2 Steel	2 Hammerhead
3 Reinforced concrete	3 Bent
4 Plain concrete	4 Solid
5 Prestressed concrete	5 Hollow (e.g., rubble fill)
6 Stone-masonry	9 Other
7 Encased structural steel	
8 Concrete unknown, cannot determine type (i.e., reinforcement)	
9 Other	

Blank No Pier Present

Note:

The coding of 8 is provided to describe field observable conditions. Use only when more detailed or exact plan information does not exist.

VD17 Pier Foundation Type

Inventory > Design

Description:

This item indicates the type of foundation used for the piers of a bridge.

Procedure:

Select the appropriate code from the dropdown list for each pier.

A coding of blank is not permitted for this item unless no pier is present.

Coding:

A	Footing on competent bedrock*	K	Footing or culvert with an integral bottom on erodible bedrock (such as claystone, clay shale, silt stone, shale or weathered bedrock)
B	Cast-in-place concrete piles	L	Footing and culverts with an integral bottom on soil (sand-gravel, cobbles, silt and clay)
C	precast concrete piles	O	Other (describe in item IN24, inspection notes)
D	Prestressed concrete piles	P	Foundation type has been researched; information is unknown or not available with confidence
E	Steel H-piles	R	Footing on bedrock – erodibility cannot be determined
F	Steel pipe piles or Micropiles	S	Pile or caissons, if determined by probing
G	Timber piles	X	Information is not available at this time
H	Drilled caisson		
I	Deep water caisson		
J	Pedestals		

Notes:

This coding system is also used in Items VD15 and IN13.

Codings of R and S are provided to describe field observable conditions. Use only when more detailed or exact plan information does not exist.

*For scour purposes, good quality rock or competent bedrock is defined as rock with no significant ongoing erosion and a low risk of failure during an extreme event.

VD18 Opening Type

Inventory > Design > Culvert Detail; Form H

Description:

This item is used to record the opening type for the culvert.

Procedure:

Select the opening type for the culvert from the dropdown list.

Coding:

A	Arch	P	Pipe Arch
C	Circular	R	Rectangular
H	Horizontal Ellipse	V	Vertical Ellipse

VD19 Length - Length of Culvert Barrel Along Its Centerline

Inventory > Design > Culvert Detail; Form H

Description:

This item is used to record the length of a structure under fill.

Procedure:

Enter total length of a culvert barrel. For culverts with multiple openings, enter the barrel length for each opening on separate line items. Measure along the underside of the top slab or crown of the barrel between outside faces of the headwall or ends of the barrels. Be sure to enter a value when 5C27 is coded "0000" and the structure carries a highway.

Coding:

The total length of the culvert, to the nearest foot.

Box Culvert Barrel Length

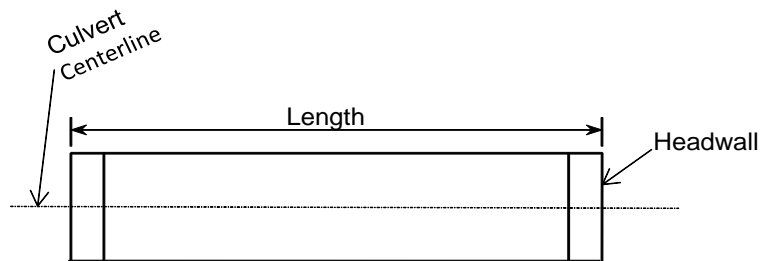


Figure 1. Plan view of culvert length measurement

VD20 Min Fill Height - Minimum Fill Height Over Culvert

Inventory > Design > Culvert Detail; Form H

Description:

This item is used to record the minimum height of fill on top of the culvert.

Procedure:

Enter the minimum height of fill on top of the culvert. For culverts with multiple openings, the minimum fill height may be entered for each opening on separate line items.

Coding:

Minimum height of fill on top of the culvert to the nearest tenth of a foot.

VD21 Max Fill Height - Maximum Fill Height Over Culvert

Inventory > Design > Culvert Detail; Form H

Description:

This item is used to record the maximum height of fill on top of the culvert.

Procedure:

Enter the maximum height of fill on top of the culvert. For culverts with multiple openings, the maximum fill height may be entered for each opening on separate line items.

Coding:

Maximum height of fill on top of the culvert to the nearest tenth of a foot.

VD22 Eff Width - Effective Width of Hydraulic Opening

Inventory > Design > Culvert Detail; Form H

Description:

This item is used to record the effective width of the hydraulic opening, excluding the wall between two culverts (twin boxes) or the wall thickness and the distance between boxes or pipes.

Procedure:

Enter the effective width of the hydraulic opening. For culverts with multiple openings, the *width* may be entered for each opening on separate line items.

Coding:

The effective width of the hydraulic opening to the nearest tenth of a foot.

VD23 Tie Type - Type of Tie for Tied Arch Culverts

Inventory > Design > Culvert Detail

Description:

This item indicates the type of tie used on a tied arch culvert.

Procedure:

For tied arch culverts, select the code from the dropdown list that describes the type of tie used. Leave blank if culvert is not a tied arch culvert.

Coding:

- 1 Reinforced
- 2 Post-tensioned
- 9 Other

VD24 Floor Type

Inventory > Design > Culvert Detail

Description:

This item indicates the type of culvert floor.

Procedure:

Select the code from the dropdown list that indicates the type of culvert floor.

Coding:

- C Concrete floor without a fish channel
- F Concrete floor with a fish channel
- M Metal
- N Natural Streambed

VD25 Exp Joint Type - Expansion Joint Type 📄

Inventory > Design > Deck Joint; Form B > Wearing Surface

Description:

This item indicates the type(s) of deck joints on the bridge.

Procedure:

Select the type of joint(s) from the dropdown list.

Coding:

- | | |
|---------------------------------------|--|
| A Open Joint | K Reinforced Elastomeric Dam |
| B Premolded Filler | L Modular |
| C Neoprene Sponge | M Strip Seal |
| D Plate Dam | N Armored Preformed Neoprene Compression Dam |
| E Plate Dam w/Galvanized Gutter | O Other |
| F Plate Dam w/Neoprene Gutter | P Asphaltic Plug |
| G Tooth Dam | R Preformed Silicone |
| H Tooth Dam w/Galvanized Gutter | S Two Part Silicone |
| I Tooth Dam w/Neoprene Gutter | T Two Part Silicone W/ Polymer Nosing |
| J Preformed Neoprene Compression Seal | |

Applicable for deck joints only

VD26 Movement Class - Expansion Joint Movement Class

Inventory > Design > Expansion Joint; Form B > Wearing Surface

Description:

This item indicates the movement class for the joints identified in item VD25.

Procedure:

Select the movement class for each joint from the dropdown list.

Coding:

- | | |
|---|--------------------------|
| A Up to 2" (also use for fixed joint, i.e., "0" movement) | F Over 16" and up to 20" |
| B Over 2" and up to 4" | G Over 20" and up to 24" |
| C Over 4" and up to 8" | H Over 24" and up to 28" |
| D Over 8" and up to 12" | I Over 28" and up to 32" |
| E Over 12" and up to 16" | J Over 32" |

Applicable for deck joints only

VD27 Manufacture Code - Expansion Joint Manufacturer

Inventory > Design > Expansion Joint; Form B > Wearing Surface

Description:

This item indicates the manufacturer of the joints identified in item VD25

Procedure:

Select the manufacturer of each joint from the dropdown list.

Coding:

A Acme	K R J Watson
B Watson Bowman	L SSI
C Harris	M Amrod
D Felpro	N LB Foster
E D S Brown	O Other
F Royston	P Kard
G Unknown	Q Pelet
H Not Applicable	R RP Machinery
I Reserved	S Safety Guard
J Dow Corning	

Applicable for deck joints only.

VD28 Haunch Types

Inventory > Design

Description:

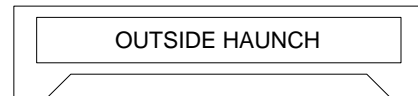
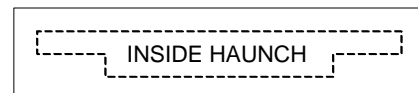
This item indicates the type of haunch in the prestressed beams.

Procedure:

For bridges with prestressed beams, enter the code which describes the haunch, inside or outside.
If there are no haunches in the prestressed beams, code zeros.

Coding:

- 0 No haunch
- 1 Inside haunch only
- 2 Outside haunch only
- 3 Inside and Outside haunches



VD29 Special Pier Cap - Type of Special Pier Cap

Inventory > Design

Description:

This item indicates the type of special pier cap, if any, present on the bridge.

Procedure:

If a special pier cap has been used, select the code from the dropdown list that describes the type of pier cap.

Coding:

1	Pre-fab post-tensioned	5	Integral pier cap (prestressed concrete)
2	Post-tensioned	6	Integral pier cap (steel)
3	Post-tensioned – special (strengthened through external post-tensioning)	7	Integral pier cap (reinforced concrete)
4	Steel box girder	8	Reserved
		9	Other

VD30 Bearing Types - Type of Bearings

Inventory > Design

Description:

This item indicates the type(s) of bearings used on the bridge.

Procedure:

From the dropdown list select the type(s) of bearing(s) that are on the bridge.

Coding:

NN	Not applicable (for structures such as culverts, etc.)	12	Graphite Asbestos
01	Fixed through dowels	13	Lead
02	Expansion through dowels	14	Grout
03	Steel Plates	15	Asphalt Felt/Tar Paper
04	Lubrite Plates	16	Fabrica
05	Rockers	17	Pot Bearings
06	Rocker Nest	18	Neoprene (plain) and Sliding Steel Plates
07	Rollers	19	Neoprene (laminated) and Sliding Steel Plates
08	Roller-Nest-Open	20	Preformed Fabric and Sliding Steel Plates
09	Roller-Nest-Enclosed	21	Spherical –Bronze or Steel
10	Neoprene (plain)	22	Disk Bearings
11	Neoprene (laminated)	99	Other

VD31 Bridge Cleaning- Number of Locations for Bearing Seat and Horizontal Surface Cleaning

Form B > Wearing Surface

Description:

This item is used to record the number of substructure units that have open bearing areas accessible* for cleaning and flushing and have a deck joint (i.e. expansion devices on the bridge or open joints, refer to Item 6A41). This item also includes any additional areas that require horizontal surface cleaning.

Procedure:

Enter the number of substructure units and/or additional locations that require bearing seat and/or horizontal surface cleaning. This number should account for all possible areas and not only areas that currently have debris build-up.

Coding:

Enter the number of substructure units and/or additional locations. Each substructure unit shall only be counted once. For a structure with greater than 99 substructure units requiring cleaning and flushing, enter a value of 99.

Example:

Two-span, continuous structure, with deck joints at the abutments, should be coded with a count of "2" locations. If the District Bridge Engineer requests the bearing area at the pier to be cleaned because of pigeon debris, the count should be changed to "3" locations.

*Note: This would not include joints with full-depth concrete diaphragms. The word accessible should not be used to describe the method in which access to the location is gained.

VD32 Cleaning Notes - Bridge Cleaning Notes

Form B > Wearing Surface

Description:

The item is used to record notes for the structure related to bridge seat cleaning and/or horizontal surface cleaning.

Procedure:

Record any narrative information about the structure that may be useful for future cleanings. Specific substructure units should be identified as well as if the cleaning and flushing is required for bearing seats and/or horizontal surfaces at those substructure units.

VD33 Scuppers w/Downspouts - Number of Scuppers with Downspouts

Form B > Wearing Surface

Description:

This item is used to record the number of scuppers with downspouts on a structure. Downspouts are pipes that carry the drain water to, or near, the ground beneath the structure.

Procedure:

Enter the total number of scuppers with downspouts for the entire bridge. If none, enter zero. Locations where the piping is not present or only extends beyond the bottom of the superstructure should be counted in VD34.

Coding:

Enter the number of scuppers with downspouts for the entire bridge. For structures with 99 or more scuppers with downspouts, enter a value of 99.

VD34 Scuppers w/o Downspouts - Number of Scuppers without Downspouts

Form B > Wearing Surface

Description:

This item is used to record the number of scuppers without downspouts on a structure. The field is intended to record scuppers where the outlet pipe does not exist or only extends to the bottom of the girders but is not carrying the drain water to, or near, the ground beneath the structure.

Procedure:

Enter the total number of scuppers without downspouts for the entire bridge. If none, leave zero. Locations where the piping extends to or near ground level should be counted in VD33.

Coding:

Enter the number of scuppers without downspouts for the entire bridge. For structures with 99 or more scuppers without downspouts, enter a value of 99.

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VN Inventory - Drawings and Notes

The Inventory - Drawings and Notes screen is used to enter various storage and design drawings numbers for a structure. The screen is listed under Inventory Links.

Fields that contain repeating values (e.g., Design Exception Codes, Steel Types, Bearing Types, etc.) are shown in plain list boxes, with no limits to the maximum number of items that can be added to these lists. To add items to a list, use the Add Item button corresponding to that list. This will display an Add Item dialog to allow user to input data specific to the list. To remove items, select one or more items (use Ctrl + Click to select multiple items), and use the Delete Item(s) button. Users will be prompted by the system to confirm deletion before the records are removed. The Save button is used to commit pending changes on the screen, if any, to the database.

VN01 Design Exception Codes

Inventory > Drawings Notes

Description:

This item is used to indicate whether a design exception has been granted by the FHWA in its authorization of Federal funds for bridge rehabilitation or replacement.

Procedure:

Select the appropriate code from the dropdown list to indicate the type of design exception granted by FHWA. Enter this code when Federal funds have been authorized for the construction phase of the project, i.e., when FHWA has approved Form D-4232.

Coding:

1	Bridge Width	4	Any Combination of Above
2	Over or Under Clearance	5	Traffic Safety Feature End Transition
3	Live Load	Blank	No exception requested or granted

VN02 Soil Boring Notes

Inventory > Drawings Notes

Description:

This item is used to record notes concerning the soil borings performed for the structure during construction.

Procedure:

Enter any notes concerning the soil borings performed for the structure during construction in narrative form.

Coding:

Notes concerning the soil borings performed for the structure during construction in narrative form.

VN03 Test Description

Inventory > Drawings Notes

Description:

This item is used to record the testing performed for concrete or steel member properties (e.g. Charpy V-Notch (CVN) test, concrete compression strength testing, petrographic tests, etc.).

Procedure:

Enter information concerning the testing performed for member properties in narrative form.

Coding:

Enter information concerning the testing performed for member properties in narrative form. The type of test, the date(s) the testing was performed, who performed the testing and the results of the testing are all valuable information to enter in this field.

VN04 Storage Location

Inventory > Drawings Notes

Description:

This item is used to identify the location of documents in storage for the structure.

Procedure:

Enter a narrative description for the location of documents in storage for the structure.

Coding:

Narrative description for the location of documents in storage for the structure. Examples of notes for this item could be room numbers where the documents are filed, drawer numbers, or electronic file locations.

VN05 Design Drawing Numbers

Inventory > Drawing Notes > Drawing Detail

Description:

This two part field is used to record the original design drawing number(s) and descriptive text for each drawing.

Procedure:

For each design drawing for the structure, enter the drawing number in Field 1 and a description of the design drawing in Field 2.

If the design drawing number is unknown, leave all fields blank, for not applicable.

Coding:

The design drawing number in Field 1 and a description of the design drawing in Field 2.

Suggestion:

If no information is known to be available, enter "UNAVAIL" in Field 1. Department standard drawings (including TC's) can be entered if plan numbers are not known.

VN06 Shop Drawing Numbers

Inventory > Drawing Notes > Drawing Detail

Description:

This two part item is used to record the original shop drawing number(s) and descriptive text for each drawing.

Procedure:

Enter the shop drawing number, in Field 1 and a description of the shop drawing in Field 2.

Coding:

The shop drawing number(s) in Field 1 and a description of the shop drawing in Field 2.

VN07 Repair Drawing Numbers - Drawing Number for the Repair

Inventory > Drawing Notes > Drawing Detail

Description:

This two part item is used to record the drawing number, if any, for the repair and descriptive text for each drawing.

Procedure:

Enter the drawing number for the repair in Field 1 and a description of the repair drawing in Field 2. Leave this item blank if there is no drawing number or the drawing number is unknown. Also enter this drawing number in item VN05.

Coding:

The repair drawing number in Field 1 and a description of the repair drawing in Field 2.

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VI Inventory - Inspection Planning

Required Inspection Equipment

The Inventory - Inspection Planning screen is used to record data for inspection planning. It captures and displays equipment and permits required to inspect a structure, as well as any other information that may influence the ability of the inspection team to perform their job effectively. The screen is listed under Inventory Link.

The next section, Miscellaneous Planning Information, is a group of fields that display information that affects inspection planning. Users may use the Save button to save any information entered in these fields to the database. The next section contains two tabs, Equipment and Permit. These tabs list equipment and permits required for inspecting the structure. The system allows an unlimited number of equipment items and permits to be listed in these tabs.

VI01 Min Crane Reach - Minimum Crane Reach Required

Inventory > Inspection Planning

Description:

This item indicates the minimum crane length needed to perform the inspection.

Procedure:

Enter the minimum crane length needed to perform the inspection. Leave this item blank if not applicable.

Coding:

Minimum crane length to the nearest foot.

Blank Not applicable

VI02 High Voltage Power Line

Inventory > Inspection Planning

Description:

This checkbox field indicates the presence of cables or high voltage power lines that may impede an inspection of the structure.

Procedure:

Check the box if cables or high voltage power lines that may impede an inspection of the structure are present. Otherwise, leave the box unchecked.

Coding:

Unchecked	No, high voltage power lines or cables do not exist
Checked	Yes, high voltage power lines or cables exist

VI03 RR Flagger Req'd - Railroad Flagger Required

Inventory > Inspection Planning

Description:

This checkbox field indicates whether or not a railroad flagger is required to inspect the structure.

Procedure:

Check the box if a railroad flagger is required to inspect the structure. Otherwise, leave the box unchecked.

Coding:

Unchecked No, a railroad flagger is not required to inspect the structure
 Checked Yes, a railroad flagger is required to inspect the structure

VI04 Traffic Flagger Req'd - Traffic Flagger Required

Inventory > Inspection Planning

Description:

This checkbox field indicates whether or not a traffic flagger is required to inspect the structure.

Procedure:

Check the box if a traffic flagger is required to inspect the structure. Otherwise, leave the box unchecked.

Coding:

Unchecked No, a traffic flagger is not required to inspect the structure
 Checked Yes, a traffic flagger is required to inspect the structure

VI05 Type (Left) - Left Sidewalk Type

Inventory > Inspection Planning

Description:

This item is used to record the type of protection for the left sidewalk.

Procedure:

Select the code from the dropdown list that is applicable to the type of protection between roadway (traffic) and sidewalks (pedestrians) from the dropdown list.

Coding:

- 1 Unprotected sidewalk (no barrier between roadway and sidewalk). (This code will also apply for curbs and when VI07 is coded all zeros).
- 2 Sidewalk protected by guiderail barrier
- 3 Sidewalk protected by concrete parapet barrier
- 4 Sidewalk protected by other types
- N Not applicable

VI06 Type (Right) - Right Sidewalk Type

Inventory > Inspection Planning

Description:

This item is used to record the type of protection for the right sidewalk.

Procedure:

Select the code from the dropdown list that is applicable to the type of protection between roadway (traffic) and sidewalks (pedestrians) from the dropdown list.

Coding:

- 1 Unprotected sidewalk (no barrier between roadway and sidewalk). (This code will also apply for curbs)
- 2 Sidewalk protected by guiderail barrier
- 3 Sidewalk protected by concrete parapet barrier
- 4 Sidewalk protected by other types
- N Not applicable

VI07 Width (Left) - Left Sidewalk Width

Inventory > Inspection Planning

Description:

This item is used to record the width of the left curb or sidewalks (includes curb width).

Procedure:

This item will automatically filled in based on the information from item 5B05. See coding for 5B05 for sidewalk width definitions and coding procedures.

Coding:

Width of sidewalk or curb to the nearest tenth foot.

VI08 Width (Right) - Right Sidewalk Width

Inventory > Inspection Planning

Description:

This item is used to record the width of the right curb or sidewalks (includes curb width).

Procedure:

This item will automatically filled in based on the information from item 5B06. See coding for 5B06 for sidewalk width definitions and coding procedures.

Coding:

Width of sidewalk or curb to the nearest tenth foot.

VI09 Horizontal Curve - Is the Bridge on a Horizontal Curve?

Inventory > Inspection Planning

Description:

This item indicates whether or not the bridge is located on a horizontal curve.

Procedure:

Select a code of "1" from the dropdown list if the bridge is on a horizontal curve. If the bridge is not located on a horizontal curve, select "0" (zero) for not applicable.

If only a portion of the bridge is located on either a horizontal or vertical curve, the bridge should still be coded using the above coding system.

Coding:

- 1 Bridge on a horizontal curve
- 0 Bridge not on a horizontal curve

VI10 Vertical Curve - Is the Bridge on a Vertical Curve?

Inventory > Inspection Planning

Description:

This item indicates whether or not the bridge is located on a vertical curve.

Procedure:

Select a code of "1" from the dropdown list if the bridge is on a vertical curve (hump or crest), and "2" if on a vertical curve (sag). If the bridge is not located on a vertical curve, select "0" (zero) for not applicable.

If only a portion of the bridge is located on either a horizontal or vertical curve, the bridge should still be coded using the above coding system.

Coding:

- 0 Bridge not on a vertical curve
- 1 Bridge on a vertical curve (hump or crest)
- 2 Bridge on a vertical curve (sag)

VI11 Inspection Limitations

Inventory > Inspection Planning

Description:

This item is used to record any inspection limitations for the structure.

Procedure:

Enter any notes concerning any inspection limitations that may be present at the bridge site.

Coding:

Notes may be entered to describe any physical limitations that the District may encounter when performing bridge inspections. Limitations may include detailed information on the width of sidewalks, pedestrian barriers, limited opening size between truss members, etc.

VI12 Equipment Type - Special Equipment Type

Inventory > Inspection Planning > Equipment Detail

Description:

This item is used to record the special equipment that is needed and/or could be useful in completing an inspection.

Procedure:

Select the code from the dropdown list that describes the needed and/or useful bridge inspection equipment.

Coding:

- A Personnel Lift
- B Inspection Crane
- C Rigging
- D Underwater
- K Traffic Control
- L Boat
- N Lantern or Lighting
- O Other

VI13 Quantity - Equipment Quantity

Inventory > Inspection Planning > Equipment Detail

Description:

This item is used to record the quantity of equipment required for the inspection.

Procedure:

Enter the quantity of equipment required for the inspection.

Coding:

Quantity of equipment required for the inspection.

VI14 Consumable?

Inventory > Inspection Planning > Equipment Detail

Description:

This display only item indicates whether or not the equipment is consumable.

Procedure:

Check the box if the inspection equipment is consumable. Otherwise, leave the box unchecked.

Coding:

- Unchecked Equipment is not consumable
- Checked Equipment is consumable

VI15 Assigned To

Inventory > Inspection Planning > Equipment Detail

Description:

This display only item indicates whether the equipment is assigned to the inspection team, individual, or both.

Procedure:

Enter the name of the company, inspection team or individual that the equipment is assigned to.

Coding:

Enter the name of the company, inspection team or individual that the equipment is assigned to.

VI16 Notes

Inventory > Inspection Planning > Equipment Detail

Description:

This item is used to record additional information regarding the equipment and its usage.

Procedure:

Enter any notes concerning the selected equipment.

Coding:

Additional information regarding the equipment and its usage.

VI17 (Not Used - Reserved for Future Use)

VI18 Type - Permit Type

Inventory > Inspection Planning > Permit Detail

Description:

This item is used to record the type of permit required to conduct the inspection.

Procedure:

Select the code from the dropdown list that describes the needed permit type.

Coding:

RR - Railroad

VI19 (Not Used - Reserved for Future Use)

VI20 POC - Point of Contact

Inventory > Inspection Planning > Permit Detail

Description:

This item is used to record the name of the point of contact that issues the permit required.

Procedure:

Enter the name of the point of contact.

VI21 Phone - Phone # for Point of Contact

Inventory > Inspection Planning > Permit Detail

Description:

This item is used to record the phone # for the point of contact.

Procedure:

Enter the phone# of the point of contact.

VI22 Fax - Fax # for Point of Contact

Inventory > Inspection Planning > Permit Detail

Description:

This item is used to record the fax # for the point of contact.

Procedure:

Enter the fax# of the point of contact.

VI23 Email - Email for Point of Contact

Inventory > Inspection Planning > Permit Detail

Description:

This item is used to record the email for the point of contact.

Procedure:

Enter the email of the point of contact.

VI24 Notes

Inventory > Inspection Planning > Permit Detail

Description:

This item is used to record additional information regarding the permits.

Procedure:

Enter any notes concerning the permits.

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VS Inventory - Signs / Lights

The Inventory - Signs/Lights screen allows users to view and/or edit information related to sign structures and high mast light towers. The screen is listed below Inventory Links.

VS01 (Not Used – Reserved for Future Use. Use Item 6A26)

VS02 (Not Used – Reserved for Future Use. Use Item 6A27)

VS03 (Not Used – Reserved for Future Use. Use Item 6A28)

VS04 (Not Used – Reserved for Future Use. Use Item 6A29)

VS05 Mount Type - Mounting Type

Inventory > Signs and Lights

Description:

This item indicates the type of mounting for the sign structure or high mast light pole.

Procedure:

Select the type of mount from the dropdown list.

Coding:

G Ground Mounted
S Structure Mounted

VS06 Foundation Type

Inventory > Signs and Lights

Description:

This item indicates the type of foundation for the sign structure or high mast light pole

Procedure:

Select the appropriate foundation code from the dropdown list.

Note:

Coding of R is provided to describe field observable conditions. Use only when more detailed or exact plan information does not exist.

Coding:

- A Footing on competent bedrock*
- B Cast-in-place concrete piles
- C precast concrete piles
- D Prestressed concrete piles
- E Steel H-piles
- F Steel pipe piles
- G Timber piles
- H Drilled caisson
- I Deep water caisson
- J Pedestals
- K Footing or culvert with an integral bottom on erodible bedrock (such as claystone, clay shale, silt stone, shale or weathered bedrock)
- L Footing and culverts with an integral bottom on soil (sand-gravel, cobbles, silt and clay)
- O Other (describe in item IN24, inspection notes)
- P Foundation type has been researched; information is unknown or not available with confidence
- R Footing on bedrock – erodibility cannot be determined
- S Pile or caissons, if determined by probing
- X Information is not available at this time
- Z Metal foundation

VS07 Manufacturer

Inventory > Signs and Lights

Description:

This item indicates the manufacturer of the lights.

Procedure:

Enter the name of the manufacturer in narrative form.

VS08 Insp Location Info - Inspection Location Information

Inventory > Signs and Lights

Description:

This item is used to record information about how to inspect the structure.

Procedure:

Enter narrative information on how to inspect the structure, such as the location of the key to the lockbox for a high mast light tower.

VS09 (Not Used – Reserved for Future Use. Use Item 5A15)

VS10 (Not Used – Reserved for Future Use. Use Item 5A16)

VS11 Number of Signs - Number of Signs Displayed on Sign Structure

Inventory > Signs and Lights

Description:

This item is used to record the number of signs that are displayed on the sign structure.

Procedure:

Enter total number of signs on the sign structure or mounted to the bridge.

Coding:

Total number of signs on the structure. Do not count extension panels as separate signs.

VS12 Number of Lights - Number of Lights on Structure

Inventory > Signs and Lights

Description:

This item is used to record the number of lights that are on the sign or high mast light tower.

Procedure:

Enter total number of lights on the structure.

Coding:

Total number of lights on the structure.

VS13 through VS16 (Not Used - Reserved for Future Use)

VS17 Distance from Rdwy - Distance From Roadway

Inventory > Signs and Lights

Description:

This item is used to record the distance from the edge of roadway travel lane to the face of the structure, looking segments ahead (see Fig 1).

Procedure:

Enter the distance from edge of roadway to the face of the structure, looking segments ahead.

Coding:

Distance from edge of roadway to structure to the nearest foot. (See sketch below for measurement locations to determine VS17)

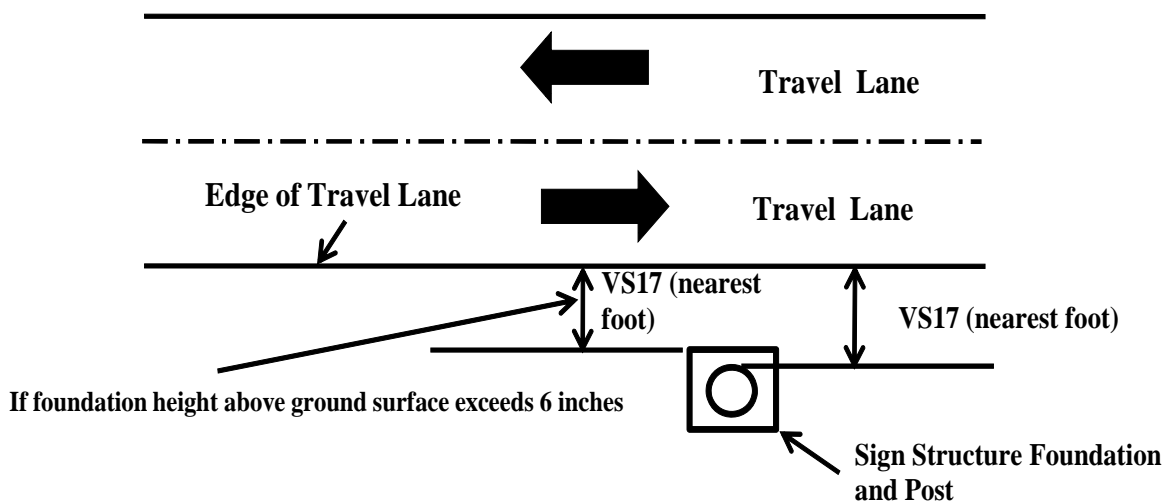


Figure 1. Measurement location for VS17

VS18 Direction from Rdwy - Direction From Roadway

Inventory > Signs and Lights

Description:

This item is used to record the direction the horizontal distance in item VS17 was measured, looking segments ahead.

Procedure:

Select the direction from the dropdown list.

Coding:

R Right
L Left

VS19 Max Diameter - Maximum Diameter of High Mast Tower

Inventory > Signs and Lights

Description:

This item is used to record the maximum diameter of the high mast tower.

Procedure:

Enter the maximum diameter of the high mast tower to the nearest tenth of an inch.

Coding:

Maximum diameter of the high mast tower to the nearest tenth of an inch.

VS20 Min Diameter - Minimum Diameter of High Mast Tower

Inventory > Signs and Lights

Description:

This item is used to record the minimum diameter of the high mast tower.

Procedure:

Enter the minimum diameter of the high mast tower to the nearest tenth of an inch.

Coding:

Minimum diameter of the high mast tower to the nearest tenth of an inch.

VS21 Mount Bolt Base - Is the Mounting Bolt Base Grounded?

Inventory > Signs and Lights

Description:

This item indicates whether or not the mounting anchor bolt base is grounded.

Procedure:

If the mounting anchor bolt base is grounded, select "Yes". Otherwise, select "No".

Coding:

- 0 The mounting anchor bolt base is not grounded
- 1 The mounting anchor bolt base is grounded

VS22 Height - Height of High Mast Tower

Inventory > Signs and Lights

Description:

This item is used to record the height of the high mast tower.

Procedure:

Enter the height of the tower to the nearest tenth of a foot.

Coding:

Actual height of the high mast tower in feet to the nearest tenth of a foot.

VS23 Movement

Inventory > Signs and Lights

Description:

This item is reserved for future use.

VS24 Alignment

Inventory > Signs and Lights

Description:

This item is reserved for future use.

VS25 Total Area of Sign - Total Area of Signs on the Structure

Inventory > Signs and Lights

Description:

This item is used to record the total area of signs on the structure.

Procedure:

Enter the total area of signs in square feet.

Coding:

Enter the total area of signs in square feet.

Example:

There are two signs on the structure that are 76"x105" and 76"x96".
This is a total of 106 square feet.

106

VS26 Height of Highest Col - Height of Column

Inventory > Signs and Lights

Description:

This item is used to record the height of the highest column to the nearest tenth of a foot.

Procedure:

For a three chord truss, measure from the top of the pedestal to the center of the mid-chord. For a four chord truss, measure from the top of the pedestal to the center of the top chord. For a single strut cantilever, measure from the top of the pedestal to the center of the strut. For a double strut cantilever, measure from the top of the pedestal to the center of the top strut.

Coding:

Actual height of the column in feet to the nearest tenth of a foot.

Examples:

Height

50'-6"

50.50

30'-0"

30.00

VS27 Total Horz Length - Length of Sign Structure

Inventory > Signs and Lights

Description:

This item is used to record the length of the sign structure to the nearest tenth of a foot.

Procedure:

This item will be automatically filled in by the system based on information entered in item 5B18. This item should not be changed, but the displayed value should be confirmed.

VS28 Number of Spans

Inventory > Signs and Lights

Description:

This item is used to describe the number of spans of the sign structure.

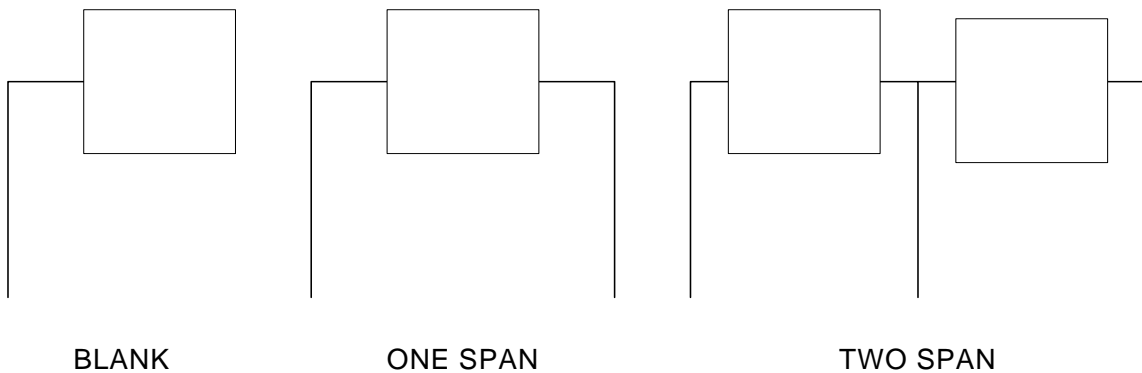
Procedure:

This item is used to count the total number of spans of the sign structure. A sign structure which spans a divided highway with a median column and berm columns on each side has two spans.

Leave blank for structure mounted or cantilever sign structures.

Coding:

The total number of spans. Acceptable coding: 1 - 9 and blank



VS29 (Not Used – Reserved for Future Use. Use Item 5A19)

VS30 Median Width Under – Median Width

Inventory > Signs and Lights

Description:

This item is used to record the width of median located under an overhead sign structure.

Procedure:

Enter the median width under an overhead sign structure to the nearest foot. Measure the horizontal distance between inside edges of adjacent lanes.

Coding:

The median width under overhead structure to the nearest foot.

Examples:

<u>Median Width</u>	
23'-6"	24

VS31 through VS33 (Not Used - Reserved for Future Use)

VS34 DMS - Dynamic Message Sign

Inventory > Signs and Lights

Description:

This item is used to indicate the supported sign type is DMS.

Procedure:

Indicate whether the sign supported is a DMS type of sign.

Coding:

Unchecked: Sign type supported by the sign structure is other than DMS
Checked: Sign type supported by the sign structure is DMS

[the remainder of this page is intentionally left blank]

VT Inventory - Tunnels

The Inventory - Tunnel screen allows users to view and/or edit information related to tunnels. The screen is listed below Inventory Links. The field names below are taken directly from the Specification for the National Tunnel Inventory (SNTI). The description, procedure and coding is provided in SNTI.

Age and Service Items:

A.8 - Service in Tunnel

Inventory > Tunnels

Classification Items:

C.3 - Direction of Traffic

Inventory > Tunnels

C.4 - Toll

Inventory > Tunnels

C.7 - Functional Classification

Inventory > Tunnels

C.8 - Urban Code

Inventory > Tunnels

Identification Items:

I.15 - Border Tunnel State Code

Inventory > Tunnels

I.16 - Border Tunnel Financial Responsibility

Inventory > Tunnels

I.17 - Border Tunnel Number

Inventory > Tunnels

I.18 - Border Tunnel Inspection Responsibility

Inventory > Tunnels

Navigation:**N.1 - Under Navigable Waterway**

Inventory > Tunnels

N.2 - Navigable Waterway Clearance

Inventory > Tunnels

N.3 - Tunnel or Portal Island Protection From Navigation

Inventory > Tunnels

Structure Type and Material Items:**S.1 - Number of Bores**

Inventory > Tunnels

S.2 - Tunnel Shape

Inventory > Tunnels

S.3 - Portal Shape

Inventory > Tunnels

S.4 - Ground Conditions

Inventory > Tunnels

S.5 - Complex

Inventory > Tunnels

Items listed in a greyed box do not require input from the user. The fields are automatically populated by the system, if applicable. Refer to Appendix D for the BMS2 to SNTI Conversion.

VW Inventory - Walls

The Inventory - Wall screen allows users to view and/or edit information related to retaining walls and noise walls. This screen is only shown when the user selects a wall type structure. The screen is listed below the Inventory Links.

VW01 (Not Used – Reserved for Future Use. Use Item 6A26)

VW02 (Not Used – Reserved for Future Use. Use Item 6A27)

VW03 (Not Used – Reserved for Future Use. Use Item 6A28)

VW04 (Not Used – Reserved for Future Use. Use Item 6A29)

VW05 Foundation Type

Inventory > Walls

Description:

This item indicates the type of foundation for the wall structure.

Procedure:

Select the appropriate foundation code from the dropdown list. A coding of blank is not permitted for this item.

Note:

Codings of R and S are provided to describe field observable conditions. Use only when more detailed or exact plan information does not exist.

Coding:

A	Footing on competent bedrock*	K	Footing or culvert with an integral bottom on erodible bedrock (such as claystone, clay shale, silt stone, shale or weathered bedrock)
B	Cast-in-place concrete piles	L	Footing and culverts with an integral bottom on soil (sand-gravel, cobbles, silt and clay)
C	precast concrete piles	O	Other (describe in item IN24, inspection notes)
D	Prestressed concrete piles	P	Foundation type has been researched; information is unknown or not available with confidence
E	Steel H-piles	R	Footing on bedrock – erodibility cannot be determined
F	Steel pipe piles	S	Pile or caissons, if determined by probing
G	Timber piles	X	Information is not available at this time
H	Drilled caisson		
I	Deep water caisson		
J	Pedestals		

*For scour purposes, good quality rock or competent bedrock is defined as rock with no significant ongoing erosion and a low risk of failure during an extreme event.

VW06 Backfill/Damping 1 - Primary Backfill Material

Inventory > Walls; Form W

Description:

This item is used to indicate the primary type of backfill material.

Procedure:

Select the code from the dropdown list for the primary type of backfill material. If a secondary type of backfill material exists, select the appropriate code in item VW07.

Coding:

11	Soil	23	Coarse Aggregate, No. 57
12	Granular Material	24	Local Stone
13	Shale	35	<u>Geosynthetic Reinforced Soil</u>
20	Rock	91	Random Material
21	Coarse Aggregate, Type C	99	Other
22	Coarse Aggregate, No. 1		

Example:

Backfill material is compacted soil with coarse aggregate No. 57 for drainage. Estimated percentage is 10% aggregate, 90% soil.

VW07 Backfill/Damping 2 - Secondary Backfill Material

Inventory > Walls; Form W

Description:

This item is used to indicate the secondary type of backfill material.

Procedure:

Select the code from the dropdown list for the secondary type of backfill material.

Coding:

11	Soil	23	Coarse Aggregate, No. 57
12	Granular Material	24	Local Stone
13	Shale	35	<u>Geosynthetic Reinforced Soil</u>
20	Rock	91	Random Material
21	Coarse Aggregate, Type C	99	Other
22	Coarse Aggregate, No. 1		

Example:

Backfill material is compacted soil with coarse aggregate No. 57 for drainage. Estimated percentage is 10% aggregate, 90% soil.

VW08 Historic Elig Info - Historic Eligibility Information

Inventory > Walls

Description:

This item is used to record information about the contributing historic eligibility of the structure.

Procedure:

Enter information about the historic eligibility of the structure in narrative form.

VW09 Manufacturer

Inventory > Walls

Description:

This item is used to record the name of the wall manufacturer.

Procedure:

Enter the name of the wall manufacturer in narrative form.

VW10 Wall Use

Inventory > Walls

Description:

This item is used to describe the use of the wall.

Procedure:

Select the appropriate code from the dropdown list.

Coding:

- | | | | |
|---|------------------------------|---|--|
| 1 | Roadside Retaining Wall | 5 | Wingwall and Retaining Wall |
| 2 | Bridge Abutment | 6 | Bridge Abutment, Wingwall and Retaining Wall |
| 3 | Wingwall | 7 | Noise Wall |
| 4 | Bridge Abutment and Wingwall | 9 | Other |

Example:

Retaining wall is a bridge abutment and wingwall.
It extends 200 feet from the bridge

6 - Bridge Abutment, Wingwall ▼

VW11 Mount Type - Mounting Type

Inventory > Walls

Description:

This item is used to record whether the structure is mounted on a bridge or on the ground.

Procedure:

Select the type of mounting for the wall structure from the dropdown list.

Coding:

- G Wall mounted on ground
- S Wall mounted on bridge

VW12 Post Type

Inventory > Walls

Description:

This item is used to record the type of posts used for the noise wall structure.

Procedure:

Select the type of posts used for the noise wall structure from the dropdown list.

Coding:

- A Reinforced Concrete Post Type
- B Steel Post Type

VW13 (Not Used – Reserved for Future Use. Use Item 5A15)

VW14 (Not Used – Reserved for Future Use. Use Item 5A16)

VW15 Architectural Forms - Were Architectural Forms Used?

Inventory > Walls

Description:

This item indicates whether or not architectural forms were used on the wall

Procedure:

If architectural forms were used on the wall, select "1 - Yes" from the dropdown list. If architectural forms were not used, select "0 - No".

Coding:

- 0 No, Architectural forms were not used on the wall
- 1 Yes, Architectural forms were used on the wall

VW16 Type of Reinforcement Bar Protection

Inventory > Walls

Description:

This item indicates the type of protective system used on the reinforcement bars in the concrete wall.

Procedure:

Select the appropriate code from the dropdown list.

Coding:

- 1 Bare reinforcement bars
- 2 Galvanized reinforcement bars
- 3 Epoxy coated reinforcement bars
- 4 Dual protection (i.e., combination of 2 and 3)
- 9 Other
- N Not Applicable

VW17 F'CI - Compressive Strength Concrete at 28 Days

Inventory > Walls

Description:

This item is used to record the specified compressive strength of the concrete at 28 days.

Procedure:

Enter the specified compressive strength of concrete at 28 days.

Coding:

The specified compressive strength in pounds per square inch (psi). If more than one strength of concrete is used, code "9999".

VW18 Support Info - Support Information

Inventory > Walls

Description:

This item is used to record information about the support for the wall.

Procedure:

Enter "Up" to indicate that the wall is holding back a hill or slope. Enter "Down" to indicate that the wall is supporting the roadway.

Coding:

Up Wall is holding back a hill or slope
Down Wall is supporting the roadway

VW19 Direction Info - Direction Information

Inventory > Walls

Description:

This item is used to record left and right, location information to be passed to RMS.

Procedure:

Select the code from the dropdown list that indicates the direction of the wall support, looking segments ahead.

Coding:

Left Support is to the left
Right Support is to the right

VW20 Installed/Retrofitted

Inventory > Walls

Description:

This item indicates whether the wall was installed on a new roadway or retrofitted to an existing roadway.

Procedure:

Select the code from the dropdown list that indicates whether the wall was installed on a new roadway or retrofitted to an existing roadway.

Coding:

- N The wall was installed on a new roadway
- E The wall was retrofitted to an existing roadway

VW21 County - Wall Location - Begin and End

Inventory > Walls

Description:

This two part item is used to record the County in which the wall begins and ends.

Procedure:

In Field 1, select the County in which the wall begins from the dropdown list. In Field 2, select the County in which the wall ends.

Coding:

County in which the wall is located.

01 Adams	15 Chester	29 Fulton	43 Mercer	57 Susquehanna
02 Allegheny	16 Clarion	30 Greene	44 Mifflin	58 Tioga
03 Armstrong	17 Clearfield	31 Huntingdon	45 Monroe	59 Union
04 Beaver	18 Clinton	32 Indiana	46 Montgomery	60 Venango
05 Bedford	19 Columbia	33 Jefferson	47 Montour	61 Warren
06 Berks	20 Crawford	34 Juniata	48 Northampton	62 Washington
07 Blair	21 Cumberland	35 Lackawanna	49 Northumberland	63 Wayne
08 Bradford	22 Dauphin	36 Lancaster	50 Perry	64 Westmoreland
09 Bucks	23 Delaware	37 Lawrence	51 Pike	65 Wyoming
10 Butler	24 Elk	38 Lebanon	52 Potter	66 York
11 Cambria	25 Erie	39 Lehigh	53 Schuylkill	67 Philadelphia
12 Cameron	26 Fayette	40 Luzerne	54 Snyder	
13 Carbon	27 Forest	41 Lycoming	55 Somerset	
14 Centre	28 Franklin	42 McKean	56 Sullivan	

VW22 SR - State Route Number - Begin and End

Inventory > Walls

Description:

This two part item is used to record the beginning and end state route designations of features inventoried using the Department's Location Referencing System.

Procedure:

Enter the State Route identification for each route identified as a feature that has been inventoried using the Department's Location Reference System. The State Route at the beginning of the wall should be entered in Field 1, and the State Route at the end of the wall should be entered in Field 2, looking segments ahead.

Coding:

Refer to the coding of Data Item 5C06. Code this item only if the feature is a state route or other route that has been inventoried using the Department's Location Referencing System.

VW23 Segment - Segment Designation - Begin and End

Inventory > Walls

Description:

This two part item is used to record the beginning and end route segment designations of features inventoried using the Department's Location Referencing System.

Procedure:

Enter the segment(s) identification for each route identified as a feature that has been inventoried using the Department's Location Reference System. The segment at the beginning of the wall should be entered in Field 1, and the segment at the end of the wall should be entered in Field 2, looking segments ahead.

Coding:

Code this item only if the feature is a state route or other route that has been inventoried using the Department's Location Referencing System.

VW24 Offset - Begin and End

Inventory > Walls

Description:

This item is used to record the distance in feet from the beginning of the segment to the beginning and end of the wall.

Procedure:

Enter the offset distance at the beginning of the structure in Field 1 and enter the offset distance at the end of the structure in Field 2, looking segments ahead.

Coding:

Distance in feet from the beginning of the segment to the beginning and end of the structure.

VW25 Distance to Road

Inventory > Walls

Description:

This item is used record the distance from the base of the wall to the road.

Procedure:

Enter the distance from the base of the wall to the road.

Coding:

Distance from the base of the wall to the road to the nearest tenth of a foot.

VW26 Slope - Backfill Slope

Inventory > Walls

Description:

This item is used to describe the slope of the backfill behind the retaining wall.

Procedure:

Enter the slope of the backfill.

Coding:

Code the slope of the backfill in the form: 1:__.__

Examples:

Slope

1:2.5

1:1

VW27 Min Clearance - Minimum Clearance

Inventory > Walls

Description:

This item is used to record the minimum lateral clearance for the wall with respect to the corresponding roadway.

Procedure:

Enter the minimum lateral clearance along the length of the wall with respect to the corresponding roadway.

Coding:

Minimum lateral clearance with respect to the corresponding roadway to the nearest tenth of a foot.

VW28 Min Wall Height - Minimum Wall Height

Inventory > Walls

Description:

This item is used to record the actual minimum wall height.

Procedure:

Enter the minimum stem height to the nearest tenth of a foot.*

*Measured from top of footing to bearing seat.
Recorded in order of preference from as-built drawings, design plans, or field value for exposed stem.

Coding:

Minimum stem height in feet and inches*.

Example

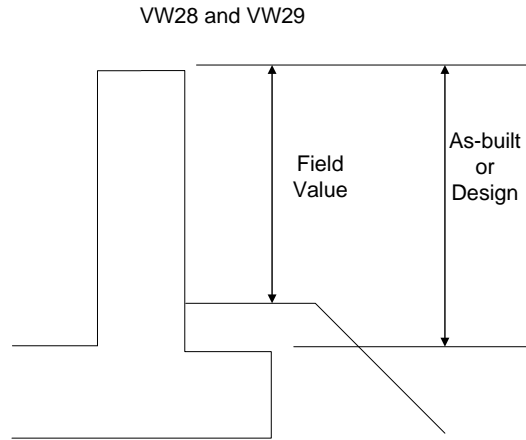
Wall Height

14'-6"

14.5

8'-3"

8.3



VW29 Max Wall Height - Maximum Wall Height

Inventory > Walls

Description:

This item is used to record the actual maximum wall height.

Procedure:

Enter the maximum stem height*.

*Measured from top of footing to bearing seat.
Recorded in order of preference from as-built drawings, design plans, or field value for exposed stem.

Coding:

Maximum stem height to the nearest tenth of a foot.*

Example

Wall Height

14'-6"

14.5

37'-10"

37.8

VW30 (Not Used - Reserved for Future Use. Use Item 5B18)

VW31 Total Area - Approximate Area of the Wall

Inventory > Walls

Description:

This item is used to enter the area of the retaining wall in square feet.

Procedure:

Enter the total area of the wall to the nearest square foot.

Coding:

The total area of the wall to the nearest square foot.

VW32 (Not Used - Reserved for Future Use. Use Item 2A02)

VW33 (Not Used - Reserved for Future Use. Use Item 5A21)

VW34 (Not Used - Reserved for Future Use. Use Item 5A20)

SG Structure Group

The Structure Group screen allows users to view and/or edit information related to structure groups. This screen allows users to establish relationships between structures within BMS2. Structures can be a part of multiple structure groups. The screen is listed below the Inventory Links.

SG01 Type - Structure Group Type

Inventory > Structure Group

Description:

This item indicates the structure group type. The structure group type describes the relationship between the structures within the group.

Procedure:

Select the appropriate group type from the dropdown list. A coding of blank is not permitted for this item.

Coding:

1 - Predecessor Successor	Group demolished structures and their replacements
2 - Interchange	Group structures that comprise an interchange
3 - Border Bridge	Group bridges that border other states
9 - Test Structures	Group structures used in BMS2 for testing purposes

SG02 Group Name - Structure Group Name

Inventory > Structure Group

Description:

This item indicates the structure group name. The structure group name describes the structure group in a narrative form.

Procedure:

Enter the name of the structure group in narrative form. The structure group name should be unique and easily identify the group.

Coding:

A narrative description of the group.

Example:

Eisenhower Interchange
I-81/Cameron Street Interchange

SG03 Group ID – Structure Group Identification Number

Inventory > Structure Group

Description:

This item indicates structure group identification number.

Procedure:

This field is automatically calculated by the system when a new structure group is added to BMS2.

Coding:

A unique, numerical number assigned by the system.

SG04 Relationship – Structure Group Relationship Type

Inventory > Structure Group

Description:

This item indicates the structure group relationship type between structures.

Procedure:

Select the appropriate structure group relationship type from the dropdown list. A coding of blank is not permitted for this item. When the SG01 – Group Type is 1 – Predecessor Successor, the relationship type should either be 1 – Predecessor or 2 – Successor. In most cases, a bridge should only have a single predecessor and a single successor. When the SG01 - Group Type is 2 – Interchange, the main structure should be identified as 3 – Primary and the remaining structures should be identified as 4 – Secondary.

Coding:

1 – Predecessor	Indicates the structure that preceded the selected structure
2 – Successor	Indicates the structure that succeeded the selected structure
3 – Primary	Indicates the main structure in a structure group
4 – Secondary	Indicates the secondary structure(s) in a structure group

SG05 Description – Structure Group Description

Inventory > Structure Group

Description:

This item is used to record notes about the structure group in narrative form.

Procedure:

Record any narrative information about the structure group that may be useful for future applications or inspections.

IA Inspection - Safety Features

This screen captures and displays information related to safety features of structures. The screen is listed below the Inspection Links.

IA01 Location

Inspection > Safety Features > Safety Feature Detail; Form A > Traffic Safety Features

Description:

This item indicates the location of the safety feature.

Procedure:

Select the code from the dropdown list that indicates the location of the safety feature. The location should match the controlling location for each IA02 rating.

Coding:

- 1 Left
- 2 Right
- 3 Near Left
- 4 Near Right
- 5 Far Left
- 6 Far Right

*IA02 Adequacy - Adequacy of Traffic Safety Features

Inspection > Safety Features > Safety Feature Detail; Form A > Traffic Safety Features

Description:

This item indicates the adequacy of bridge railings, transitions, approach guiderail, and approach rail ends.

Procedure:

This code is comprised of 4 parts. Enter the appropriate code in the respective row for the item described below. Apply the codes only to the route on the bridge.

1 - Bridge Railings

Some factors that affect proper functioning of bridge railings are height, material, strength and geometric features. Railings must be capable of smoothly redirecting an impacting vehicle. Bridge railings should be evaluated using the AASHTO Standard Specifications for Highway Bridges as a guide for establishing an acceptable standard.

2 - Transition

The transition from approach guide rails to bridge railing requires that the approach guide rail be firmly attached to the bridge railing. It also requires that the approach guide railing be gradually stiffened as it becomes closer to the bridge railing. The ends of curbs and safety wall need to be gradually tapered out or shielded. In addition to being capable of safely redirecting an impacting vehicle, the approach rail must also facilitate a transition to the bridge railing that will not cause snagging or pocketing of any impacting vehicle. This guiderail may not be required in urban environments. See paragraph 3 on page 3-254. This is also applicable to approach guiderail.

3 - Approach Guiderail

Evaluate structural adequacy and compatibility of the approach guiderail with the transition. Rarely does the need for a barrier stop at the end of the bridge. Thus, approach with adequate length and structural qualities to shield motorists from the hazards at the bridge site needs to be evaluated.

Where the approach guiderail is not warranted and not provided, code an 8 for this subitem. Where the approach guiderail is required, but is not present, code a 2 for this subitem. If there is some substandard guiderail present, code the approach guiderail no lower than a 3.

4 - Approach Rail Ends

As with ends in general, the ends of the approach rails to bridges should be flared, buried, made breakaway or shielded. Approach rail ends out of the Clear Zone (1) and accepted impact attenuation devices in good condition should be coded 8.

The use of turned down end treatments no longer meets standards for the following installations on any roadways:

- 1 Within the clear zone, and
- 2 Posted speed \geq 45 mph (ref. RC-52M 8-21-02) (high speed) and/or
- 3 ADT \geq 4000 (high volume)
- 4 NHS

For bridges carrying high speed or high volume roadways, accepted impact attenuators are required.

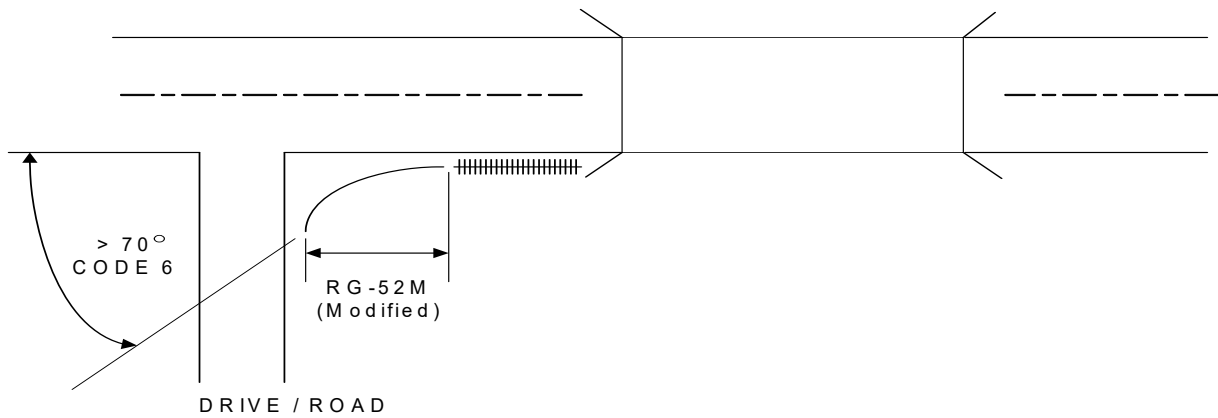
Reference RC-57M and RC-58M for Tapered Concrete End Treatments and code as follows. Where a sloped end Jersey barrier section (RC-58) without approach guiderail is used adjacent to the roadway, the coding should be 8222. This is because a blunt end impact is possible whether or not the roadway section is closed by barrier curbs (height \geq 6"). For the RC-58 detail to be acceptable, the parapet end must be beyond the clear zone or provided with impact protection. If the parapet end sections are sloped in accordance with RC-57 and the posted speed is less than 40 mph current standards are met, and the coding should be 8888.

Where design exceptions have been granted for non-standard installations the coding should be 8666. The design exceptions should be in the bridge inspection file and in BMS2 Item VN01.

*Turned down end treatments (RC-52M) and old standard end treatments including the SENTRE, MELT, and ELT systems not meeting NCHRP 350 criteria, but are in good condition that are within the clear zone on high speed or high volume roadways are to be coded 6 (GUIDERAIL maintenance item, priority 5). Damaged turned down ends requiring repair/replacement are to be coded 3 (GUIDERAIL maintenance item, priority 1).

When Type 2S guiderail extends beyond the minimum required length of 87.5 ft, or where it transitions into weak post system, the purpose of protecting the motoring public from impacting the bridge parapet has been mitigated. The proper coding for this situation is 8.

When the bridge is adjacent to intersecting driveways or roads, a *turned down end treatment may be coded 6 when its orientation to the bridge roadway is $> 70^\circ$.



The following systems are accepted impact attenuators and meet NCHRP 350 criteria for high speed, high volume roadways:

- A Brakemaster crash cushion end terminal
- B (C-A-T) Crash cushion/attenuating terminal
- C (ADIEM) Advanced dynamic impact extension module
- E (SKT-350) Sequentially kinking terminal
- F (REGENT) Redirecting gating end terminal
- G (FLEAT-350) Flared energy absorbing terminal
- H (SRT-350) Slotted rail terminal
- I (REACT-350) Reusable Energy Absorbing Crash Terminal
- J (BEST) Beam eating steel terminal
- K (ROSS-350) Guide rail terminal
- L (BEAT-SSCC) Box Beam Burster Energy Absorbing Terminal Single Sided Crash Cushion
- M WIDETRACC
- O SCI-100GM
- P Wide REACT

(1) For determination of clear zone, refer to DM2, Table 12.1, and Figures 12.3 and 12.4.

Coding:

- 8 When existing traffic safety feature meets current standards and is in good condition, requiring no repair.
 Features have been crash-tested at a site-appropriate level and/or accepted are to be rated similarly to current standards.
 When structure is under fill where standard roadway guiderails with adequate embedment are carried across the structure.
 When the Type 2S guiderail extends substantially beyond minimum required length (87.5' in most cases), or where it transitions into weak post system.
 When feature is not required and none is provided based on current standards. If not based on the current standards, justification when no feature is provided may include a design exception, waiver, or finding by the District Traffic Engineer. Supporting documentation MUST BE in the bridge file before the coding may be used for this purpose. There is no applicable maintenance priority for this coding.
- 7 When traffic safety feature meets code 8 and is functional except that it requires repair/replacement of deteriorated/damaged portions.

- 6 When the traffic safety feature is not in accordance with current standard but is considered adequate because of conformance to standards that have recently been updated or is an approved design exception. As a guideline, elements must satisfy the following conditions: transition must be firmly attached and gradually stiffened as it approaches the bridge railing; also approach guiderail and rail ends are deemed to have adequate length and structural qualities to shield motorists from the hazards at the bridge site.
- 5 When existing traffic safety feature meets code 6 and is functional except that it requires repair/replacement of deteriorated/damaged portions.
- 4 When existing traffic safety feature does not meet code 6 requirements but is considered adequate for the site conditions to be left as is. Examples include low ADT, low traffic speeds or *curbed sections*, and substandard approach rail ends because of parking lots and driveways, etc. For approach guiderail elements when a driveway is located near the approach end of the bridge having a rigid parapet, it is considered adequate for the site conditions to be left as is provided that no reduction in the roadway width at the bridge is encountered.
- 3 When existing traffic safety feature meets code 4 and is functional except that it requires repair/replacement of deteriorated/damaged portions.
When the bridge rail, transitions, connections, approach guiderail and rail ends are considered to be inadequate for site conditions. Examples include steel cable systems, "boxing glove" ends near roadway, damaged turned down ends on "busy NHS" routes, etc.
- 2 When traffic safety feature is required but none is provided.
When structural condition of existing barrier, its cross-section and/or its material properties, or its connection to the deck is so poor that it is unlikely to contain an errant vehicle.
- N When highway traffic does not use the bridge (i.e., pedestrian or railroad bridge over a highway)

In cases where all of these safety features do not exist, each element must still be coded. Appraise the adequacy of the existing features or lack of them in meeting current standards and criteria.

REFERENCE: Department's Standards for Roadway Construction RC-50M and RC-52M and Standards for Bridge Construction, BC-703M, BC-707M, BC-708M, BC-712M, BC-739M. Ref. RC & BC Handouts

FOR MEDIAN TREATMENTS: Ref. RC-54M, dated 8-21-02
For length of need, flare rate and end treatments

1 - Bridge Rail

BMS2 Item IA02-1 Bridge Railing Ratings RC Wall or Stepped-wall Barriers						
<ul style="list-style-type: none"> - Not in current PennDOT standards for barriers, and - Not accepted by FHWA 						
IA02A Sketch	RC Wall Height	Speed limit	Curb Height	Curb/SW Width	IA02 A CODE	
SIDEWALK BETWEEN WALL AND BRIDGE ROADWAY	$\geq 2' - 3''$	> 45 mph	All	All	2	
		≤ 45 mph	$> 4''$	$\geq 36''$	6	
				9" - 36"	4	
		$\leq 4''$	$\geq 36''$	2		
	9" - 36"		2			
$< 2' - 3''$	All	All	All	2		
NO SIDEWALK	$\geq 2' - 3''$	All	All	$< 9''$	6 [Note 2]	
	$\geq 2' - 0''$ to $< 2' - 3''$	> 45 mph	All	$< 9''$	2	
		≤ 45 mph	All	$< 9''$	4	
	$\leq 2' - 0''$	All	All	$< 9''$	2	

(a)

(b)

(c)

(d)

Metal Railing on Concrete Walls
 (Includes pipe railing or cable system)

Concrete Parapets

Note:

1. The above ratings are for barriers that are structurally sound and appear to be sufficient to contain an errant vehicle.
 - a. Downgrade IA02-1 rating from above values (Max. total reduction of 1) to consider:
 - Deteriorated or damaged structural condition.
 - For site-specific conditions that would elevate risk of collision with barrier, especially poor approach alignment, and to a lesser extent narrow deck width with ADT > 4000. Previous crash damage and history may indicate higher risk.
 - b. The metal railing on top of barrier (if present) is not considered when assessing the barrier's performance and is not to be rated for condition and/or traffic safety. Damaged rail that presents a hazard to traffic should be noted as maintenance need.
 - c. If structural condition of barrier or its connection to the deck is so poor that it is unlikely to contain an errant vehicle, CODE = 2.
 - d. If parapets are old-style pigeon-hole or solid (Sketch d), rate using table above using values for a, b, or c (using appropriate sidewalk configuration) EXCEPT when:
 - Table value is 4 or greater, and
 - Parapets are structurally damaged or deteriorated, or
 - For site-specific conditions that would elevate risk of barrier collision, especially poor approach alignment, and to a lesser extent narrow deck with ADT > 4000. Previous crash damage and history may indicate higher risk.
 Then CODE = 3 (due to poor performance of original design).
2. No wall or barrier that has not been accepted by FHWA can be rated = 8. (This is a change from previous coding instructions.)
3. Where guiderail is placed below top of wall and above curb, curb width is measured from front face of guiderail to curb edge at roadway.
4. Code 2: if sidewalk is unprotected and speed limit is > 45 mph or bridge length > 200 ft

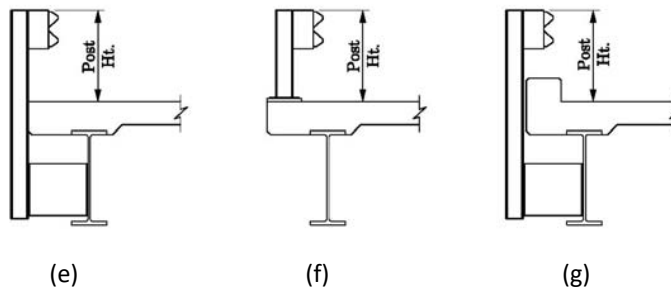
5. Note: sidewalk protection required for posted speeds > 45 mph or bridge length > 200ft (see DM4, Part B, Sec 2.3.2.2 and associated commentary)

BMS2 Item IA02-1 Bridge Railing Ratings

- As depicted in sketches below and
- Not in current PennDOT standards for barriers, and not accepted by FHWA.

Structure-Mounted Guide-Rails

IA02A Sketch	Post Height	Speed limit	POST SPACING	IA02 A CODE
e - g	$\geq 2'-3''$	All	$\leq 3' - 6''$	6 [Note 2]
	$\geq 2'-0''$ to $< 2'-3''$	> 45 mph	$\leq 3' - 6''$	2
		≤ 45 mph		4
	$\leq 2'-0''$	All	All	2



Structure-Mounted Guiderail

Note:

1. The above ratings are for structure-mounted guiderail that is structurally sound and appears to be sufficient to contain an errant vehicle.
 - a. Downgrade IA02-1 rating from above values (Max. reduction of 1) as needed to consider:
 1. Deteriorated or damaged structural condition.
 2. For site-specific conditions that would elevate risk of collision with barrier, especially poor approach alignment, and to a lesser extent narrow deck width and high ADT. Previous crash damage and history may be good indicators of higher risk.
 - b. If structural condition of barrier or its connection to the deck is so poor that it is unlikely to contain an errant vehicle, CODE = 2.
2. No structure mounted guiderail that has not been accepted by FHWA can be rated = 8. (This is a change from previous coding instructions.)

BMS2 Item IA02 -1 Bridge Railing Ratings		
<ul style="list-style-type: none"> - As depicted in sketch below and - Not in current PennDOT standards for barriers and not accepted by FHWA. 		
Safety Shape Barriers		
IA02A Sketch	Barrier Height	IA02 A Code
<p>(h)</p>	$\geq 3'-6''$	8
	$\geq 2'-3''$ to $< 3'-6''$	6
	$\geq 2'-0''$ to $< 2'-3''$	4
	$< 2'-0''$	2
<p>Note:</p> <ol style="list-style-type: none"> Downgrade IA02-1 rating from above values (Max. reduction of 1) as needed to consider deteriorated or damaged structural condition. If barrier is pre-cast concrete and located on the outside lane (not median barrier) and: <ol style="list-style-type: none"> Shows any sign of deterioration, CODE = 2. Deterioration signs may include: <ul style="list-style-type: none"> Map cracking or deterioration of concrete near base Evidence of failed deck anchorage anchors – loss of grout bed and signs of rusting Tilting or displacement of barrier Does not show deterioration, but is located on an Interstate or Expressway bridge where speed limit > 45 mph, CODE = 4. 		

BMS2 Item IA02 -1 Bridge Railing Ratings							
Culvert Embankments with and without Guiderail							
<p>With Roadway Guiderail</p>						IA02-1 Code	
	Criteria with Roadway Guiderail					Meets Criteria	Does Not Meet
Rate similarly to IA02A-3. Guiderail posts must have adequate embedment.					8	4	
Note: Downgrade IA02-1 rating by one if guiderail is damaged.							
<p>Without Roadway Guiderail</p>	Criteria without Roadway Guiderail						
	Criteria		Slope 1V:4H or flatter				Fails Slope or Clear Zone IA02-1
	Posted Speed	ADT	Clear Zone	IA02-1 Code	Clear Zone	IA02-1 Code	
	≥ 55	All	30'	8	24'	4	2
	41 – 54	> 750	30'	8	24'	4	2
< 750		20'	8	16'	4	2	
≤ 40	> 750	20'	8	16'	4	2	
	< 750	10'	8	8'	4	2	
Note: Downgrade IA02-1 rating of 8 or 4 if site is particularly hazardous or if accident history indicates greater risk.							

2 - Transition & 3 - Approach Guiderail

Reference current standard drawings RC-50M, RC-52M and BC-703M, BC-707M, BC-708M, BC-712M, BC-739M.

Note:

1. Approach end guiderail treatment is to be in place at both the approach and trailing ends of structure parapets on two lane facilities with two-way traffic. On four lane divided highways, guiderail is not required on trailing ends of parapets unless warranted by other obstructions.
2. Where transition or approach rail post do not have adequate embedment to re-direct errant vehicles, consider the element as damaged and reduce the rating by 1. Assign maintenance priority for guiderail work as follows:
 - IM05 = 2 when appraisal ratings for 4A10 Deck Geometry or 4A02 Approach Alignment are less than 6.
 - IM05 = 3 Otherwise
3. DM2 Chapter 12 and the AASHTO "Roadside Design Guide" barrier guidelines recognize that the requirements for barrier are based on a roadside elements and conditions for each site. As such, sidewalk barrier, transition and approach guide rail for bridges having a curbed sidewalk may not be required based on a finding by an engineer qualified to evaluate and determine appropriate traffic safety features in accordance with the design documents. This finding must be maintained in the bridge file and should be the basis for the coding in IA02 and maintenance recommendations. Sources of qualified engineers may include District Traffic Units, Municipal engineers, or engineering firms specializing in highway traffic safety. Local owners should be strongly encouraged to obtain the traffic safety review and findings for their bridges as discussed above. In the absence of documentation to the contrary, safety feature installation recommendations based on strict interpretation of the standards using the appropriate maintenance priority codes must be made.

4 - Approach Rail End

Reference current standard drawings RC-52M and RC-54M.

Note:

Code 8 only when:

- Outside clear zone, OR
- Posted speed limit < 45 MPH AND ADT < 4,000

IA03 Description - Safety Feature Description

Inspection > Safety Features > Safety Feature Detail; Form A > Traffic Safety Features

Description:

This item is used to record a narrative description of the safety feature.

Procedure:

Enter a description of the safety feature in narrative form.

IR Inspection - Load Rating

The Load Rating screen allows a user to enter rating data for a structure. This screen is listed under Inspection Links.

The Load Rating screen provides the ability to create or remove a load rating set from the history of load ratings for the structure corresponding to the Calculation date. **All load rating data for all structures shall be entered through this screen.** Load Rating details are displayed on the bottom of the screen for the selected record in this section. When the user clicks the Save button, the current load rating data is used to update the corresponding load rating data fields shown on the BMS2 Load Rating Screen. The load rating values in the BMS2 fields are overlaid with the updated values from this screen – the data created through this screen is the most current load rating information for the structure.

Adding New Load Rating Sets to BMS2

For the purposes of this process, a load rating set consists of Inventory and Operating Ratings for various load types with a corresponding analysis method (BMS2 items IR04 through IR21). In this process, load rating sets do not refer to the engineering datasets for PennDOT bridge analysis programs, such as BAR7.

Many bridges have existing rating analysis stored in BMS2 that are current and valid, but the calculation date (IR03) in BMS2 is incorrect. Due to database restrictions, users cannot simply edit the most recent calculation date (IR03). A new rating set must be created and assigned to the inspection. When a new rating set is created, all of the existing data is copied from the last rating set. To update the most recent calculation date for a valid load rating set, Districts must follow the procedure described below.

BMS2 is capable of storing several complete load rating sets for each bridge. Each inspection can only have one “assigned” load rating set that will be used for NBI purposes. When entering a new load rating set into BMS2, the “new” load rating set must be assigned or linked to its corresponding inspection as per Step 5 below.

Instructions for Entering New Load Rating Sets on the Inspection Load Rating Screen:

1. **Establish a new Calculation Date (IR03)** for the load rating set by clicking the "New Rating Set" button:
 - Enter the date the new load rating was performed into Calculation Date field (IR03) and hit save to allow further editing of the load rating set.
2. **Enter load ratings for various load types.** When a new load set is generated, the load ratings for the various load types from the prior Calculation Date are copied to the new data set as a convenience to the user. The user must verify and/or edit the load rating data as required.
 - Click the Add Item button to create a new load type for a rating set, if necessary.
 - Click the Delete Item button to remove the load types. Users may only select one Load Type at a time. BMS2 prompts users to confirm deletion before the load type records are removed.
3. **Save the preliminary Load Rating Set.** Once the new load ratings are entered, save the new ratings by clicking the Save button at the top right of the screen. Incomplete records may be edited at this time or later. This load rating set is considered preliminary until review/acceptance and assignment to an inspection. **Note: Saving a new rating set will lock the previous rating set from editing. Once saved, the rating set being entered can be edited until the entry of next new rating set, but it cannot be removed.**
4. **QC review of the Load Rating** The load rating reviewer must review and accept the preliminary re-rating for completeness and accuracy before the load rating set is assigned to the inspection in BMS2.
 - If acceptable, the reviewer changes the IR01b Reviewer Action code to "3 Re-rating Completed" in BMS2.
 - This indicates that the load re-rating is in accordance with PennDOT policies.
5. **Assign the new load rating set to an inspection.** To link an inspection with its corresponding load rating, the load rating set must be assigned as follows:
 - a. Select the desired inspection date in the Inspections field at the top of the screen. The inspection date will typically be the most recent NBI inspection.
 - b. Once the appropriate inspection date is displayed, click the Assign Rating Set to Inspection button. Upon clicking the Assign Rating Set button, **BMS2 will automatically:**
 - Populate the Rating Date (Item IR02) with today's date.
 - Populate the Rating Approval Engineer (IR02a) with the name of the user assigned the set.

- Link the load rating set to that inspection date. **An asterisk in the IR03 Calc Date will indicate the "assigned" load rating for the inspection.** This "assigned" load rating data will be used for all NBI calculations for that inspection.
 - De-link any other load rating set previously associated to that inspection.
 - Subsequent inspections created through BMS2 will also be initially linked to the last "assigned" load rating set.
6. **Save the assigned load rating.** After assigning the new load rating set to the desired inspection, click "Save".

Notes on multiple load rating sets for a single inspection:

- BMS2 can store more than one load rating set for an individual inspection date, but only one can be maintained as the "assigned" load rating.
- A second rating set may be needed for an inspection if loadings have changed (e.g. new deck overlay) since the last inspection.
- Another use of multiple ratings (albeit, probably very rare) may occur when the rater has developed different analysis/rating scenarios and wants to review them in BMS2. BOMO recommends reviewing the scenarios separately and then entering only the selected rating scenario into BMS2.

Re-Rating Bridges Due to Changes after the Inspection

If changes to the load ratings are required due to reasons other than inspection findings more than 30 days after the inspection, the inspection manager can record the need for re-rating in BMS2 by:

- **Setting Item IR01b Reviewer Action = 5 - Re-Rate Other**
Bridges with a Reviewer Action = 5 are not part of the Re-Rating Compliance report.

Changes in loadings noted less than the 30 days after the inspection are to be considered part of the most current inspection.

- Set IR01b Reviewer Action = 2 Re-Rating Scheduled

If bridge member conditions change, re-inspect and follow normal procedure outlined above.

IR01a Load Rating Review Recommended

Inspection > Load Ratings; Form K > Load Ratings

Description:

This checkbox field indicates whether or not a bridge inspector recommends a new load rating analysis based on findings during the inspection.

Procedure:

If a bridge inspector believes a new rating analysis is required, the box should be checked to indicate "yes". If a bridge inspector doesn't believe a new rating analysis is required, the box should be unchecked to indicate "no". This checkbox cannot be changed in BMS2. Based on the coding of Field IR01b, this field may be checked or unchecked when a new inspection is created in iForms. The user should also explain why the review is recommended in the appropriate comment box.

Coding:

Unchecked	A new analysis is not recommended
Checked	A new analysis is recommended

IR01b Reviewer Action

Inspection > Load Ratings

Description:

This item allows the inspection reviewer to indicate their disposition of the Inspector recommendation.

Procedure:

Select the code from the dropdown list that indicates the reviewer's disposition of the Inspector recommendation. This value will not change unless an inspector changes the recommendation for load rating review.

Coding:

- 0 Not Reviewed – The most recent rating calculation rating has not been reviewed.
- 1 Re-rating Not Req'd - No re-rating is required
- 2 Re-rating Scheduled – Re-rating is scheduled, but not completed
- 3 Re-rating Completed – Re-rating is completed
- 5 Re-rate Other – Re-rating is required due to changes that occurred after the most recent inspection
- 6 Re-rate Other Comp – Re-rating is completed for changes that occurred after the most recent inspection

Example 1: The previous inspection had Item IR01a unchecked and Item IR01b had a value of "1 – Re-rating Not Req'd". For the current inspection, an inspector checks Item IR01a. Item IR01b will be re-set to "0 – Not Reviewed".

Example 2: The previous inspection had Item IR01a unchecked and Item IR01b had a value of "1 – Re-rating Not Req'd". For the current inspection, an inspector does not check Item IR01a. Item IR01b will stay as "1 – Re-rating Not Req'd".

Example 3: After the previous inspection, Item IR01b was coded value of "3 – Re-rating Completed" or "6- Re-rate Other Comp" and item IR01a was checked. Since the load rating was completed, the observed field conditions have not changed and therefore a re-rating is not required. For the subsequent inspection, an inspector shall uncheck item IR01a and Item IR01b should be changed back to "1- Re-rating Not Req'd."

IR02 Assigned Rating Approval Date

Inspection > Load Ratings; Form K > Load Ratings

Description:

This item indicates the date the ratings were assigned to the specific inspection record.

Procedure:

This date is automatically populated based on the date the user clicked "Assign Rating Set". The rating set shall be assigned after all reviews are complete and the ratings are sealed. The IR02 date shall match the seal date on the load rating calculations.

Note:

For bridges requiring a new or revised posting based on the new rating, the bridge posting must be installed or revised within 30 days of the IR02 calculation date.

IR02a Assigned Rating Approval Engineer

Inspection > Load Ratings

Description:

This item indicates the engineer who reviewed and approved the current assigned rating analyses.

Procedure:

This name is automatically populated based on the user who clicked "Assign Rating Set".

IR03 Calc Date - Calculation Date

Inspection > Load Ratings; Form K > Load Ratings

Description:

This item indicates the calculation date of the load rating set.

Procedure:

Enter the date the ratings were performed.

Coding:

Date the ratings were performed in MM/DD/YYYY format:

MM 2 digit month
 DD 2 digit day of month
 YYYY 4 digit year

Note:

Any one date may only be used once. Duplicate Calculation Dates are not allowed. If multiple ratings are to be entered and were performed on the same date, unique dates must be entered.

Example:

A rating was completed on April 16th, 2007 for a truss, floorbeam, stringer type bridge and the owner wants all ratings for each member type entered into BMS2. A truss member controls the rating.

Truss Calc Date: 04/16/2007
 Floorbeam Calc Date: 04/17/2007
 Stringer Calc Date: 04/18/2007

IR04 Load Type

Inspection > Load Ratings > Load Ratings Detail; Form K > Load Ratings

Description:

This item indicates the loading type for the selected record.

Procedure:

Select the type of loading from the dropdown list.

For railroad loading only, code "7" for IR04 and "0" for IR10 - Inventory Rating and IR11 - Operating Rating. For pedestrian loading code IR04 as "8" and "0" for IR10 - Inventory Rating and IR11 - Operating Rating.

If the bridge is closed and/or will not carry live load, code IR04 a "9", code IR06 a "7", and code "0" for IR10 - Inventory Rating and IR11 - Operating Rating. The use or presence of a temporary bridge requires special consideration in coding. In such cases, since there is no permanent bridge, code IR04 Load Type a

"9" and code "0" for IR10 - Inventory Rating and IR11 - Operating Rating even though the temporary structure is rated for as much as full legal load. This will also apply to a temporary runaround condition.

Coding:

1	H Loading	8	Pedestrian or Special Loading (non-highway bridges); ML80 (highway bridges)
2	HS Loading		
3	Alternate Interstate Loading	9	Gross Load Only Given
4	Type 3 Unit	0	TK527
5	Type 3S2 Unit	D	PHL-93 Loading
6	Type 3-3 Unit	E	FastAct EV-2 Loading
7	Railroad Loading	F	FastAct EV-3 Loading

For bridges with 2 or more lanes and restricted to "One truck at a time" (item VP02="R" and VP03 = "1 or 2"), ratings for 1 lane of HS and ML80 should use the following code values:

- A H Loading
- B HS Loading
- C ML80 Truck

For coding examples, see IR EXAMPLES after IR21.

IR05 NBI

Inspection > Load Ratings > Load Ratings Detail; Form K > Load Ratings

Description:

This item records which rating will be sent to the FHWA for the NBI.

Procedure:

Select the code from the dropdown menu to indicate if the load rating is the NBI rating or not. For bridges carrying highways, the HS20 or PHL-93 load type is the NBI Rating.

Coding:

- 0 Not an NBI Rating
- 1 NBI Rating

For coding examples, see IR EXAMPLES after IR21.

***IR06 Load Rating Meth - Rating Method**

Inspection > Load Ratings > Load Ratings Detail; Form K > Load Ratings

Description:

This item records the method of analysis used in determining the inventory and operating ratings.

Procedure:

Select the code from the dropdown list that describes the method of analysis used in determining the inventory and operating rating.

Coding:

- 0 No Analysis Performed
- 1 Allowable Stress Method (AS)
- 2 Load Factor Method (LF)
- 3 Level 2 Analysis
- 4 Test Loading
- 5 Other
- 6 Load Resistance Factor Design Method (LRFD)
- 7 Field Evaluation and Documented Engineering Judgment
- 8 Load Resistance Factor Rating Method (LRFR)
- A Assigned Rating Based on LFD reported in **tons**
- B Assigned Rating Based on ASD reported in **tons**
- C Assigned Rating Based on LRFD reported in **tons**
- D Assigned Rating Based on LFD reported by **rating factor** using HS20 loading
- E Assigned Rating Based on ASD by **rating factor** using HS20 loading
- F Assigned Rating Based on LRFD reported by **rating factor** using PHL93 loading
- G Automated Bridge Analysis System (ABAS)

Note:

If the bridge is closed and/or will not carry live load, code IR04 a "9", code IR06 a "7", and code "0" for IR10 - Inventory Rating and IR11 - Operating Rating. The use or presence of a temporary bridge requires special consideration in coding. In such cases, since there is no permanent bridge, code IR04 Load Type a "9" and code "0" for IR10 - Inventory Rating and IR11 - Operating Rating even though the temporary structure is rated for as much as full legal load. This will also apply to a temporary runaround condition.

For coding examples, see IR EXAMPLES after IR21.

IR07 Ctrl Memb Type - Type of Structural Member that Controls the Inventory Rating

Inspectin > Load Ratings > Load Ratings Detail; Form K > Load Ratings

Description:

This item is used to record the type of structural member controlling the inventory rating.

Procedure:

Select the code from the dropdown list that describes the type of structural member that controls or governs the inventory load rating.

Coding:

- | | |
|--|----------------|
| 1 Beam or girder (longitudinal member) | 5 Deck |
| 2 Floorbeam (transverse member) | 6 Substructure |
| 3 Hanger | 8 Stringer |
| 4 Tension member in a truss or similar structure | 9 Other |

IR08 Fatigue Stress Cat - Fatigue Stress Category of the Controlling Member

Inspection > Load Ratings > Load Ratings Detail; Form K > Load Ratings

Description:

This item is used to record the fatigue category in the controlling structural member.

Procedure:

If data item IR07 indicates that fatigue considerations control the inventory rating, enter the AASHTO fatigue stress category of the identified controlling structural member.

Coding:

A through E' - Category as determined from structural analysis computations using the current AASHTO Standard Specifications for Highway Bridges. Category F was deleted by AASHTO in 1998 and will no longer be a coding option.

1	A	6	D
2	B	7	Reserved
3	B'	8	E
4	C	9	E'
5	Reserved	N	Not applicable

IR09 Fatigue Load Type - Type of Loading that Controls the Fatigue Inventory Rating

Inspection > Load Ratings > Load Ratings Detail; Form K > Load Ratings

Description:

This item is used to record the type of loading that controls the fatigue inventory rating.

Procedure:

Select the code from the dropdown list that describes the type of loading that controls the fatigue inventory rating.

Coding:

- 1 H Loading
- 2 HS Loading
- 3 Interstate Highway Bridge Loading
- 8 Pedestrian or Special Loading (non-highway bridges)
- 9 ML80 (highway bridges)

*IR10 Inventory Rating (see IR11 Operating Rating for additional coding procedures) 📌

Inspection > Load Ratings > Load Ratings Detail; Form K > Load Ratings

Description:

This item is used to record the inventory rating. The inventory rating is that load which produces the inventory rating stresses specified in the current AASHTO Manual for Bridge Evaluation, generally the same allowable stresses used in the bridge design. The latter means that until a bridge has deteriorated structurally, or is subjected to superimposed dead loads in excess of those used in the design, the inventory rating is at least equal to the design load. Additionally, it can be stated that inventory rating is that load which can safely utilize an existing bridge for an indefinite period. In determining inventory

rating, the number of lanes to be loaded is the number of design traffic lanes in accordance with current AASHTO Standard Specifications for Highway Bridges.

Procedure:

Determine the inventory rating in accordance with the current AASHTO Manual for Bridge Evaluation.

For railroad loading only code "7" for IR04 Load Type and "0" for IR10. For pedestrian loading code IR04 - Load Type as "8" and "0" for IR10.

If the bridge is closed and/or will not carry live load, code IR04 Load Type a "9" , code IR06 a "7" , and code "0" for IR10. The use or presence of a temporary bridge requires special consideration in coding. In such cases, since there is no permanent bridge, code IR04 Load Type a "9" and code "0" for IR10 even though the temporary structure is rated for as much as full legal load. This will also apply to a temporary runaround condition.*

A bridge shored up, repaired on a temporary basis, or one on which one or more lanes are barricaded to keep the bridge open is considered a temporary bridge condition and should be coded as if the temporary shoring or temporary width restriction were not in place.

It should be emphasized that for HS loading, the total weight in tons of the entire vehicle should be coded, i.e. code HS20 as 36 even though HS20 lane loading controls and is used to determine the rating.

H loading shall be treated similarly. In order to allow uniformity in the analysis of rating data, enter a rating for HS type loading whenever possible.

For reporting PHL-93, compute tonnage using the HS-20 weight (36T) and the PHL-93 rating factor based on current wearing surface.

*Temporary condition is to be identified in item 5E03.

Coding:

Inventory rating in Tons.

For coding examples, see IR EXAMPLES after IR21.

*IR11 Operating Rating

Inspection > Load Ratings > Load Ratings Detail; Form K > Load Ratings

Description:

This item is used to record the Operating Rating. The operating rating is that load which produces the operating rating stresses specified in the current AASHTO Manual for Bridge Evaluation. The operating rating is the maximum permissible weight of the load type being evaluated, to which the structure may be subjected occasionally. In determining the operating rating, the number of lanes to be loaded will be the number of design traffic lanes in accordance with current AASHTO Standard Specifications for Highway Bridges.

Procedure:

Determine the operating rating in accordance with the current AASHTO Manual for Bridge Evaluation.

For railroad loading only, code "7" for IR04 Load Type and "0" for IR11. For pedestrian loading code IR04 - Load Type as "8" and "0" for IR11.

If the bridge is closed and/or will not carry live load, code IR04 Load Type a "9" , code IR06 a "7" , and code "0" for IR11. The use or presence of a temporary bridge requires special consideration in coding. In such cases, since there is no permanent bridge, code IR04 Load Type a "9" and code "0" for IR11 even though the temporary structure is rated for as much as full legal load. This will also apply to a temporary runaround condition.*

A bridge shored up, repaired on a temporary basis, or one on which one or more lanes are barricaded to keep the bridge open is considered a temporary bridge condition and should be coded as if the temporary shoring or temporary width restriction were not in place.

It should be emphasized that for HS loading, the total weight in tons of the entire vehicle should be coded, i.e., HS20 should be coded as "36" even though the HS20 lane loading controls and is used to determine the rating. H loading shall be treated similarly in order to allow uniformity in the analysis of rating data, a rating for the HS type loading should be entered whenever possible.

Note:

When engineering judgment is used for gross load, (item IR06, Code 7), Code type of vehicle loading considered

For reporting PHL-93, compute tonnage using the HS-20 weight (36T) and the PHL-93 rating factor based on current wearing surface.

*Temporary condition is to be identified in item 5E03.

Coding:

Operating rating in Tons.

For coding examples, see IR EXAMPLES after IR21.

IR11a SLC (Safe Load Capacity) - Rating

Inspection > Load Ratings > Load Ratings Detail; Form K > Load Ratings

Description:

This item represents the safe load carrying capacity of a structurally deficient bridge. The SLC value is a percentage less than the Operating Rating for the bridge. It is intended to reflect the capacity that is determined for a bridge based on its superstructure or substructure condition rating and Average Daily Truck Traffic (ADTT) and is used for posting purposes when less than 100% of the Operating Rating is used and intended to aid in the extension of the useful life of the bridge. Refer to SOL 495-13-08 until the SOL has been incorporated into the publication.

Procedure:

Determine the SLC Rating for the bridge by applying the Safe Load Capacity Reduction Factor to the Operating Rating. Leave the field blank if a SLC factor is not applied and the SLC equals 100% of the OR.

$$SLC = f * OR$$

ADTT ≥ 500	Superstructure or Substructure		
Condition Rating	≥ 5	4	≤ 3
<i>f</i>	1.0	0.80	0.80

ADTT < 500	Superstructure or Substructure		
Condition Rating	≥ 5	4	≤ 3
<i>f</i>	1.0	0.90	0.80

Coding:

SLC Rating in Tons.

Leave Blank if SLC equals 100% of the Operating Rating.

IR12 Govern Crit Inv - Governing Criteria - Inventory

Inspection > Load Ratings > Load Ratings Detail; Form K > Load Ratings

Description:

This item indicates the governing stress (shear or moment) for the inventory rating.

Procedure:

Select the governing stress from the dropdown list.

Coding:

- M Moment Controls
- S Shear Controls

IR13 Govern Crit Opr - Governing Criteria - Operating

Inspection > Load Ratings > Load Ratings Detail; Form K > Load Ratings

Description:

This item indicates the governing stress (shear or moment) for the operating rating.

Procedure:

Select the governing stress from the dropdown list.

Coding:

- M Moment Controls
- S Shear Controls

IR14 AASHTO Manl Yr - Year of AASHTO Manual Used in Determining Ratings

Inspection > Load Ratings > Load Ratings Detail; Form K > Load Ratings

Description:

This item is used to record the year of the AASHTO Manual for Bridge Evaluation. Use year of "interim specifications" if it governs.

Procedure:

Enter the 4 digit year.

Note:

Current adopted AASHTO Manual for Bridge Evaluation (2011).

Example:

Year 2011

IR15 AASHTO Spec Yr - Year of AASHTO Specifications Used in Determining Ratings

Inspection > Load Ratings > Load Ratings Detail; Form K > Load Ratings

Description:

This item is used to record the year of the AASHTO Specifications. Use year of "interim specifications" if it governs.

Procedure:

Enter the 4 digit year.

Note:

Current adopted AASHTO Specification: LFD Bridge Design Specifications, 17th edition.

Example:

Year 2002:

IR16 Engineer

Inspection > Load Ratings > Load Ratings Detail; Form K > Load Ratings

Description:

This item is used to record the name of the engineer who performed the load rating.

Procedure:

Enter the name of the rating engineer.

IR17 Rating Dataset

Inspection > Load Ratings > Load Ratings Detail

Description:

This item is used to record the name of the dataset utilized for the rating(s).

Procedure:

Enter the name of dataset used for the load rating.

IR18 Stress Range - Fatigue Stress Range

Inspection > Load Ratings > Load Ratings Detail; Form K > Load Ratings

Description:

This item is used to record the stress range due to loading that controls the inventory fatigue rating.

Procedure:

Enter the stress range at inventory stress level due to the load type defined in item IR09 as controlling the fatigue inventory rating.

Coding:

The live load stress range in kips per square inch to the nearest tenth.

IR19 Notes

Inspection > Load Ratings > Load Ratings Detail; Form K > Load Ratings

Description:

This item is used to record notes about the load rating.

Procedure:

Enter notes about the load rating in narrative form.

IR20 Inventory Rating Factor

Inspection > Load Ratings > Load Ratings Detail

Description:

This item is used to record the Inventory Rating Factor (IRF).

Procedure:

Determine the IRF in accordance with the current AASHTO Manual for Bridge Evaluation.

This field will only be editable if the coding of IR06 is 8, D, E, or F. Furthermore, rating factors should only be used with the coding of PHL93 loadings in IR04. For all other IR04 coding values, a tonnage shall be entered in IR10.

If the bridge is closed and/or will not carry live load, code IR04 Load Type a "9" and code "0" for IR20. The use or presence of a temporary bridge requires special consideration in coding. In such cases, since there is no permanent bridge, code IR04 Load Type a "9" and code "0" for IR20 even though the temporary structure is rated for as much as full legal load. This will also apply to a temporary runaround condition. The temporary condition is to be identified in item 5E03.

A bridge shored up, repaired on a temporary basis, or one on which one or more lanes are barricaded to keep the bridge open is considered a temporary bridge condition and should be coded as if the temporary shoring or temporary width restriction were not in place.

Coding:

Input the rating factor to two (2) decimal places.

For coding examples, see IR EXAMPLES after IR21.

IR21 Operating Rating Factor

Inspection > Load Ratings > Load Ratings Detail

Description:

This item is used to record the Operating Rating Factor (ORF).

Procedure:

Determine the ORF in accordance with the current AASHTO Manual for Bridge Evaluation.

This field will only be editable if the coding of IR06 is 8, D, E, or F. Furthermore, rating factors should only be used with the coding of PHL93 loadings in IR04. For all other IR04 coding values, a tonnage shall be entered in IR11.

If the bridge is closed and/or will not carry live load, code IR04 Load Type a "9" and code "0" for IR21. The use or presence of a temporary bridge requires special consideration in coding. In such cases, since there is no permanent bridge, code IR04 Load Type a "9" and code "0" for IR21 even though the temporary structure is rated for as much as full legal load. This will also apply to a temporary runaround condition. The temporary condition is to be identified in item 5E03.

A bridge shored up, repaired on a temporary basis, or one on which one or more lanes are barricaded to keep the bridge open is considered a temporary bridge condition and should be coded as if the temporary shoring or temporary width restriction were not in place.

Coding:

Input the rating factor to two (2) decimal places.

For coding examples, see IR EXAMPLES after IR21.

IR EXAMPLES:

Example 1: Bridge built in 2011 with plans, sealed by a professional engineer, indicating the design load is PHL-93. No changes to the loading conditions or the structure condition have occurred that would reduce the inventory rating below the design load level.

Controlling Design Rating Factors from the original sealed design plans:

	H20	HS20	ML-80	TK-527	PHL-93
IR	1.39	1.19	1.07	1.02	1.04
OR	2.32	1.98	1.78	1.70	1.73

Controlling Rating Tons from sealed load rating analysis:

	H20	HS20	ML-80	TK-527
IR	28	43	39	42
OR	48	72	66	70

Note: Based on this information, this will be an assigned load rating utilizing the existing design.

Method 1 - BMS2 coding when assigning all vehicles from existing design:

4B01 Design Load: P - PHL-93

IR04 Load Type	IR05 NBI	IR06 Load Rating Method	IR10 IR	IR11 OR	IR20 IR RF	IR21 OR RF
D - PHL-93	1 - NBI Rating	F - Assigned LRFD RF	Blank	Blank	1.04	1.73
1 - H Loading	0 - Not an NBI Rating	C - Assigned LRFD Tons	27	46	Blank	Blank
2 - HS Loading	0 - Not an NBI Rating	C - Assigned LRFD Tons	42	71	Blank	Blank
8 - ML80	0 - Not an NBI Rating	C - Assigned LRFD Tons	39	65	Blank	Blank
0 - TK527	0 - Not an NBI Rating	C - Assigned LRFD Tons	40	68	Blank	Blank

Method 2 - BMS2 coding when assigning only the PHL-93 vehicle from existing design:

4B01 Design Load: P - PHL-93

IR04 Load Type	IR05 NBI	IR06 Load Rating Method	IR10 IR	IR11 OR	IR20 IR RF	IR21 OR RF
D - PHL-93	1 - NBI Rating	F - Assigned LRFD RF	Blank	Blank	1.04	1.73
1 - H Loading	0 - Not an NBI Rating	2 - Load Factor Method	28	48	Blank	Blank
2 - HS Loading	0 - Not an NBI Rating	2 - Load Factor Method	43	72	Blank	Blank
8 - ML80	0 - Not an NBI Rating	2 - Load Factor Method	39	66	Blank	Blank
0 - TK527	0 - Not an NBI Rating	2 - Load Factor Method	42	70	Blank	Blank

Example 2: Bridge built in 2006 with plans, sealed by a professional engineer, indicating the design load is PHL-93. No changes to the loading conditions or the structure condition have occurred that could reduce the inventory rating below the design load level.

Controlling Design Rating Factors from the original sealed design plans:

	H20	HS20	ML-80	TK-527	PHL-93
IR	1.39	1.19	1.07	1.02	1.04
OR	2.32	1.98	1.78	1.70	1.73

Controlling Rating Tons from sealed load rating analysis:

	H20	HS20	ML-80	TK-527
IR	28	43	39	42
OR	48	72	66	70

Note: Based on this information, this can be an assigned load rating utilizing the existing design. In addition, a load factor method rating can be utilized as the current load rating set with HS-20 as the NBI rating.

Method 1 - BMS2 coding when assigning all vehicles from existing design:

4B01 Design Load: P - PHL-93

IR04 Load Type	IR05 NBI	IR06 Load Rating Method	IR10 IR	IR11 OR	IR20 IR RF	IR21 OR RF
D - PHL-93	1 - NBI Rating	F - Assigned LRFD RF	Blank	Blank	1.04	1.73
1 - H Loading	0 - Not an NBI Rating	C - Assigned LRFD Tons	27	46	Blank	Blank
2 - HS Loading	0 - Not an NBI Rating	C - Assigned LRFD Tons	42	71	Blank	Blank
8 - ML80	0 - Not an NBI Rating	C - Assigned LRFD Tons	39	65	Blank	Blank
0 - TK527	0 - Not an NBI Rating	C - Assigned LRFD Tons	40	68	Blank	Blank

Method 2 - BMS2 coding when assigning only the PHL-93 vehicle from existing design:

4B01 Design Load: P - PHL-93

IR04 Load Type	IR05 NBI	IR06 Load Rating Method	IR10 IR	IR11 OR	IR20 IR RF	IR21 OR RF
D - PHL-93	1 - NBI Rating	F - Assigned LRFD RF	Blank	Blank	1.04	1.73
1 - H Loading	0 - Not an NBI Rating	2 - Load Factor Method	28	48	Blank	Blank
2 - HS Loading	0 - Not an NBI Rating	2 - Load Factor Method	43	72	Blank	Blank
8 - ML80	0 - Not an NBI Rating	2 - Load Factor Method	39	66	Blank	Blank
0 - TK527	0 - Not an NBI Rating	2 - Load Factor Method	42	70	Blank	Blank

Method 3: BMS2 coding when utilizing the load factor method rating:

4B01 Design Load: P - PHL-93

IR04 Load Type	IR05 NBI	IR06 Load Rating Method	IR10 IR	IR11 OR	IR20 IR RF	IR21 OR RF
1 - H Loading	0 - Not an NBI Rating	2 - Load Factor Method	28	48	Blank	Blank
2 - HS Loading	1 - NBI Rating	2 - Load Factor Method	43	72	Blank	Blank
8 - ML80	0 - Not an NBI Rating	2 - Load Factor Method	39	66	Blank	Blank
0 - TK527	0 - Not an NBI Rating	2 - Load Factor Method	42	70	Blank	Blank

Example 3: Bridge built in 2006 with plans, sealed by a professional engineer, indicating the design load is HS-20. No changes to the loading conditions or the structure condition have occurred that could reduce the inventory rating below the design load level

Controlling Design Rating Factors from the original sealed design plans:

	H20	HS20	ML-80	TK-527
IR	1.39	1.19	1.07	1.02
OR	2.32	1.98	1.78	1.70

Controlling Rating Tons from sealed load rating analysis:

	H20	HS20	ML-80	TK-527
IR	28	43	39	42
OR	48	72	66	70

Note: Based on this information, this can be an assigned load rating utilizing the existing design. In addition, a load factor method rating can be utilized as the current load rating set with HS-20 as the NBI rating.

Method 1 - BMS2 coding when utilizing the existing design:

4B01 Design Load: 5 - HS20

IR04 Load Type	IR05 NBI	IR06 Load Rating Method	IR10 IR	IR11 OR	IR20 IR RF	IR21 OR RF
1 - H Loading	0 - Not an NBI Rating	A - Assigned LFD Tons	27	46	Blank	Blank
2 - HS Loading	1 - NBI Rating	A - Assigned LFD Tons	42	71	Blank	Blank
8 - ML80	0 - Not an NBI Rating	A - Assigned LFD Tons	39	65	Blank	Blank
0 - TK527	0 - Not an NBI Rating	A - Assigned LFD Tons	40	68	Blank	Blank

Method 2: BMS2 coding when utilizing the load factor method rating:

4B01 Design Load: 5 - HS20

IR04 Load Type	IR05 NBI	IR06 Load Rating Method	IR10 IR	IR11 OR	IR20 IR RF	IR21 OR RF
1 - H Loading	0 - Not an NBI Rating	2 - Load Factor Method	28	48	Blank	Blank
2 - HS Loading	1 - NBI Rating	2 - Load Factor Method	43	72	Blank	Blank
8 - ML80	0 - Not an NBI Rating	2 - Load Factor Method	39	66	Blank	Blank
0 - TK527	0 - Not an NBI Rating	2 - Load Factor Method	42	70	Blank	Blank

Example 4: Bridge built in 2000 with plans, sealed by a professional engineer, indicating the design load is PHL-93. The bridge was re-rated using load factor method in 2017 to reflect changes observed, which reduced the load carrying capacity.

Controlling Rating Tons from sealed load rating analysis:

	H20	HS20	ML-80	TK-527
IR	24	37	28	38
OR	41	63	48	64

Note: Based on this information, this will not be an assigned load rating and must be based on the load factor method rating.

Proper BMS2 coding:

4B01 Design Load: P - PHL-93

IR04 Load Type	IR05 NBI	IR06 Load Rating Method	IR10 IR	IR11 OR	IR20 IR RF	IR21 OR RF
1 - H Loading	0 - Not an NBI Rating	2 - Load Factor Method	24	41	Blank	Blank
2 - HS Loading	1 - NBI Rating	2 - Load Factor Method	37	63	Blank	Blank
8 - ML80	0 - Not an NBI Rating	2 - Load Factor Method	28	48	Blank	Blank
0 - TK527	0 - Not an NBI Rating	2 - Load Factor Method	38	64	Blank	Blank

Example 5: Bridge built in 1961 and designed by LFD for HS20 loading. The superstructure was replaced in 2014 and plans are available, sealed by a professional engineer, indicating the design load is PHL-93. No changes to the loading conditions or the structure condition have occurred since the superstructure replacement that could reduce the inventory rating below the design load level.

Controlling Design Rating Factors from the sealed superstructure replacement design plans:

	H20	HS20	ML-80	TK-527	PHL-93
IR	1.39	1.19	1.07	1.02	1.04
OR	2.32	1.98	1.78	1.70	1.73

Controlling Rating Tons from sealed load rating analysis:

	H20	HS20	ML-80	TK-527
IR	28	43	39	42
OR	48	72	66	70

Note: Based on this information, this can be an assigned load rating utilizing the superstructure replacement design. In addition, a load factor method rating can be utilized as the current load rating set with HS-20 as the NBI vehicle.

Method 1 - BMS2 coding when utilizing the superstructure replacement design and assigning all vehicles from the design:

4B01 Design Load: P - PHL-93

IR04 Load Type	IR05 NBI	IR06 Load Rating Method	IR10 IR	IR11 OR	IR20 IR RF	IR21 OR RF
D - PHL-93	1 - NBI Rating	F - Assigned LRFD RF	Blank	Blank	1.04	1.73
1 - H Loading	0 - Not an NBI Rating	C - Assigned LRFD Tons	27	46	Blank	Blank
2 - HS Loading	0 - Not an NBI Rating	C - Assigned LRFD Tons	42	71	Blank	Blank
8 - ML80	0 - Not an NBI Rating	C - Assigned LRFD Tons	39	65	Blank	Blank
0 - TK527	0 - Not an NBI Rating	C - Assigned LRFD Tons	40	68	Blank	Blank

Method 2 - BMS2 coding when assigning only the PHL-93 vehicle from existing design:

4B01 Design Load: P - PHL-93

IR04 Load Type	IR05 NBI	IR06 Load Rating Method	IR10 IR	IR11 OR	IR20 IR RF	IR21 OR RF
D - PHL-93	1 - NBI Rating	F - Assigned LRFD RF	Blank	Blank	1.04	1.73
1 - H Loading	0 - Not an NBI Rating	2 - Load Factor Method	28	48	Blank	Blank
2 - HS Loading	0 - Not an NBI Rating	2 - Load Factor Method	43	72	Blank	Blank
8 - ML80	0 - Not an NBI Rating	2 - Load Factor Method	39	66	Blank	Blank
0 - TK527	0 - Not an NBI Rating	2 - Load Factor Method	42	70	Blank	Blank

Method 3: BMS2 coding when utilizing the load factor method rating:

4B01 Design Load: P - PHL-93

IR04 Load Type	IR05 NBI	IR06 Load Rating Method	IR10 IR	IR11 OR	IR20 IR RF	IR21 OR RF
1 - H Loading	0 - Not an NBI Rating	2 - Load Factor Method	28	48	Blank	Blank
2 - HS Loading	1 - NBI Rating	2 - Load Factor Method	43	72	Blank	Blank
8 - ML80	0 - Not an NBI Rating	2 - Load Factor Method	39	66	Blank	Blank
0 - TK527	0 - Not an NBI Rating	2 - Load Factor Method	42	70	Blank	Blank

Example 6: Bridge built in 2011 with plans, sealed by a professional engineer, indicating the design load is PHL-93. The bridge was impacted in 2019 by a vehicle and sustained damage which has reduced the inventory rating below the design load level.

Controlling Rating Factors from the sealed LRFD load rating analysis:

	H20	HS20	ML-80	TK-527	PHL-93
IR	1.11	0.85	0.85	0.81	0.83
OR	1.85	1.58	1.42	1.36	1.38

Note: Based on this information, this will not be an assigned load rating and must be based on the LRFD rating.

Proper BMS2 coding:

4B01 Design Load: P - PHL-93

IR04 Load Type	IR05 NBI	IR06 Load Rating Method	IR10 IR	IR11 OR	IR20 IR RF	IR21 OR RF
D - PHL-93	1 - NBI Rating	6 - Load and Resistance Factor Method	Blank	Blank	0.83	1.38
1 - H Loading	0 - Not an NBI Rating	6 - Load and Resistance Factor Method	22	37	Blank	Blank
2 - HS Loading	0 - Not an NBI Rating	6 - Load and Resistance Factor Method	30	56	Blank	Blank
8 - ML80	0 - Not an NBI Rating	6 - Load and Resistance Factor Method	30	51	Blank	Blank
0 - TK527	0 - Not an NBI Rating	6 - Load and Resistance Factor Method	32	54	Blank	Blank

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IT Inspection - Load Rating Tunnels

The Inspection - Load Rating - Tunnels screen allows users to view and/or edit information related to load rating and restrictions of tunnels. The screen is listed below Inspection Links. The field names below are taken directly from the Specification for the National Tunnel Inventory (SNTI). The description, procedure and coding is provided in SNTI.

Load Rating Items:

L.1 - Load Rating Method

Inspection > Load Ratings

L.2 - Inventory Load Rating Factor

Inspection > Load Ratings

L.3 - Operating Load Rating Factor

Inspection > Load Ratings

L.4 - Tunnel Load Posting Status

Inspection > Load Ratings

L.5 - Posting Load - Gross

Inspection > Load Ratings

L.6 - Posting Load - Axle

Inspection > Load Ratings

L.7 - Posting Load - Type 3

Inspection > Load Ratings

L.8 - Posting Load - Type 3S2

Inspection > Load Ratings

L.9 - Posting Load - Type 3-3

Inspection > Load Ratings

L.10 - Height Restriction

Inspection > Load Ratings

L.11 - Hazardous Material Restriction

Inspection > Load Ratings

L.12 - Other Restrictions

Inspection > Load Ratings

Items listed in a greyed box do not require input from the user. The fields are automatically populated by the system, if applicable. Refer to Appendix D for the BMS2 to SNTI conversion.

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IF Inspection - Fracture Critical

The screen captures and displays fracture critical inspection data for structures. The screen is listed under Inspection Link. At the top of the screen is the Select Inspection section. It allows users to choose a specific structure inspection. The Create button is used to create new Fracture Critical Member Detail records (green plus sign). The Remove button is used to remove Fracture Critical Member Detail records. The user is prompted for confirmation before any record is removed. The Save button saves pending changes on the screen to the database.

IF01 FC Location

Inspection > Fracture Critical; Form F

Description:

This item is used to record the location of the FCM member/detail.

Procedure:

Select the structure unit where the fracture critical detail is located. The number of structure units will vary for each bridge depending on the number of spans. The available structure units to select from will be automatically populated based on the information from the Inventory - Structure Units Screen (5D).

Coding:

Select the structure unit where the fracture critical detail is located.

Examples:

The FCM detail is located in Span 1:

The FCM detail is located on Pier 2:

1 / Type=M
P02 / Type=P

IF02 FC Member Type - Fracture Critical Member Type

Inspection > Fracture Critical; Form F

Description:

This item indicates the fracture critical member type.

Procedure:

Select the type of fracture critical member from the dropdown list.

Coding:

- | | |
|------------------------------|-------------------|
| 01 Girder / Beam | 08 Cross Girder |
| 02 Suspended Hanger Assembly | 09 Steel Pier |
| 03 Truss - Bottom Chord | 10 Tension Member |
| 04 Truss - Diagonal | 11 Floorbeam |
| 05 Truss - Top Chord | 12 Stringer |
| 06 Tied Arch | 13 Gusset Plate |
| 07 Cable | |

IF03 FC Member - Fracture Critical Member

Inspection > Fracture Critical; Form F

Description:

This 50-character field is used to record the description of the fracture critical member.

Procedure:

Enter the FCM identified in items IF01 and IF02.

Coding:

Enter the description of the member that is fracture critical.

Examples:

The FCM is the bottom chord of a single span through truss, member L₃L₄:

The FCM is the upstream welded plate girder of a two-girder bridge:

IF04 Member Detail - Fracture Critical Detail

Inspection > Fracture Critical; Form F

Description:

This 50 character field is used to record the fracture critical member's detail.

Procedure:

Enter the FCM detail identified in items IF01 and IF03.

Coding:

Enter the detail that is fracture critical.

The following codings were used for intersecting welds in BMS and may still be used at the District's discretion:

<u>BMS Coding</u>	<u>Description</u>
WEB/W_BRACE_CON	Girder web and wind bracing connection
WEB/FB_CONN	Girder web and Floorbeam connection
LONG/TRAN_STIFF	Intersection of longitudinal and transverse stiffeners
FLANGE/FB_CONN	Girder flange and Floorbeam connection
FL/W BRACE_CON	Flange and Wind Bracing Connection
T_STIFF /NO_COPE	Girder Web to Stiffener intersection
MISC	Other Details

Examples:

The FCM detail is a welded lateral bracing connection plate:

The FCM detail is midspan at a weld toe termination of a longitudinal stiffener.

IF05 Fatigue Stress Category of the Fracture Critical Detail

Inspection > Fracture Critical > Fracture Critical Detail; Form F

Description:

This item is used to record the fatigue category of the fracture critical detail.

Procedure:

Select the AASHTO fatigue stress category of the identified fracture critical detail from the dropdown list.

Coding:

A through E' Category as determined from Table 10.3.1B in Chapter 10 of the current AASHTO Standard Specification for Highway Bridges. **Note:** For intersecting weld detail, Code E or E'

- A
- B
- B'
- C
- C'
- D
- E
- E'

IF06 Member Detail Condition - Fracture Critical Member Detail Condition

Inspection > Fracture Critical > Fracture Critical Detail; Form F

Description:

This item is used to record the fracture critical member's detail condition.

Procedure:

Enter the FCM detail condition identified in items IF01, IF03 and IF04.

Coding:

Enter the condition of the detail that is fracture critical.

Note:

Concise narrative is required.

Examples:

The FCM detail is a transverse web gusset plate:

NO VISIBLE CRACKS

The FCM detail is a transverse web gusset plate:

NO VISIBLE CRACKS, ULTRASONIC USED

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IU Inspection - Underwater Observed Scour Assessment (OSA) Tab

The Inspection - Underwater Scour - OSA screen is used to view and edit SAR calculation data and information regarding current and potential scour countermeasures. It also provides the capability to automatically calculate the OSA (Observed Scour Assessment) and SAR (Scour Assessment Rating) for the entire structure.

IU00a (Not Used - Reserved for Future Use)

IU00b (Not Used - Reserved for Future Use)

IU01 (Not Used - Reserved for Future Use)

IU02 Num Units - Number of Units Inspected with Divers

Inspection > Underwater; Form G

Description:

This item is used to record the number of units of the bridge that received an underwater (with divers) inspection. A unit would consist of a pier, abutment, and/or culvert.

Procedure:

Record the number of piers, abutments, or culverts that received an underwater (with divers) inspection.

Coding:

Enter the number of piers, abutments, and/or culverts that were inspected with divers.

Example:

A bridge with 10 piers was inspected. Five of the piers were inspected by divers:

5

IU03 SCBI Source

Inspection > Underwater; Form G

Description:

This item indicates the method used to determine the SCBI for the structure.

Procedure:

Select the method from the dropdown list that indicates the method used to determine the appropriate Scour Critical Bridge Indicator (SCBI) code for the structure. Only one of the two options can be chosen at a time for a specific structure.

Coding:

- C Computed/H&H Analysis - The bridge foundations or scour measures have been designed to resist failure due to scour as determined by the calculated results of a formal Hydrologic and Hydraulic (H & H) Analysis. **Therefore, the appropriate SCBI code has been pre-determined based on this knowledge and the SCBI/SAR Scour Calculator should not be used for this bridge although it should be run to support the assessed conditions.**
- O Observed - The bridge foundations or scour countermeasures have not been designed to resist failure due to scour; therefore, the SCBI code has been determined based on observed field conditions and the SCBI/SAR Scour Calculator.

Note: When IU03 = C, the bridge is still required to have an observed scour assessment and the scour calculator should be run. If IU04 is determined to be 5 or below, the inspector should review the SC inputs and determine if the IU03 coding should be changed from "C" to "O" to reflect SC input changes from the designed condition determined through an H&H Analysis.

IU04 Overall SCBI - Observed Scour Assessment (OSA)

Inspection > Underwater > SCBI; Form G > SCBI Calculation Data

Description:

This display only item indicates the Observed Scour Assessment (OSA) based on the current inspection data.

Procedure:

This field is **automatically calculated by the system** when the "Calculate" button is clicked. The calculator should be run during each inspection if IN fields changed. If IU04b is checked, this field will automatically update each time scour data is changed on Underwater subunit screen.

Coding:

Observed Scour Assessment. Item 4A08 – Scour Critical Bridge Indicator (SCBI) should be set equal to Item IU04.

IU04b Calculate Indicator – Was the Scour Calculator run for this Inspection?

Inspection > Underwater > SCBI; Form G > SCBI Calculation Data

Description:

This display only item indicates if the scour calculator button was clicked for the specific inspection record.

Procedure:

This field is **automatically calculated by the system** when the "Calculate" button is clicked.

Coding:

Checked	SCBI Calculator was run for this inspection record
Unchecked	SCBI Calculator was not run for this inspection record

IU05 (Not Use – Reserved for Future Use)

IU06 Stream Bed Material

Inspection > Underwater > SCBI; Form G > SCBI Calculation Data

Description:

This two part item correlates the stream bed material (native or paved) under the bridge with respect to its potential for general scour. The stream bed material is to be evaluated and coded in relation to its general ability to withstand degradation due to scour.

Procedure:

1st field: select the predominant type of stream bed material under the bridge from the dropdown list.

2nd field: select the 2nd most common type of streambed material from the dropdown list. The 2nd field is typically only utilized for wide channels and the streambed is different or if the distance between substructure units is greater than 150' apart.

The coding of this field, as well as IN15 consists of two components, the amount of scour present and the description of the material. Carefully read the scour description **AND** the material description. If there are two possibilities of stream material, then pick the one that best describes the **scour** description. Within each coding below, the scour description is provided first, and the material examples are provided in parenthesis.

Note: For rock streambeds, or those with paving or countermeasures that are fully or partially overlaid with alluvium, the rock, paving, or countermeasure is to be coded in the 1st field.

Coding:

Countermeasures-Non-designed scour protection (used to correct a previous scour issue):

C8 Streambed paved in good condition and adequate to resist scour (concrete, stone masonry, gabion blankets, or grout bags).

C7 Streambed paved, however, minor problems exist. Scour protection is adequate. Refer to Publication 15M (DM-4), Chapter 7, and Publication 408, Section 850, for the required minimum size of rip-rap to qualify as a countermeasure (concrete gabions, grout bags, or rip-rap in good condition).

The coding of C8 and C7 should be reserved for substructure units where a previous scour issue has been corrected with the placement of a countermeasure. FHWA considers countermeasures as a corrective action. Bridges with countermeasures require a Plan of Action and are considered to be Scour Critical Category D. For newer bridges when the SCBI Source is "C-Computed" and the conditions present match the designed condition, code the streambed material as "A6".

Bedrock Streambeds (not riprap) (refer to DM-4, Chapter 7, for additional guidance on types of bedrock):

R9 Minor scour may be present near substructure, but the chance of undermining is remote. Minor scour holes may exist away from the substructure units. Minor faulting or weathering may be present (Non-erodible rock).

R8 Minor scour may exist, but undermining is not present. Scour holes may exist away from the substructure units. Rock may be faulted, weathered and/or soft (Erodible rock).

R7 Advanced scour is present and is adjacent to substructures. However, there is little risk that scour could cause structure instability during high flows. Advanced weathering and/or faulting may be present (Erodible rock).

R4 Advanced or serious scour that could advance and threaten substructures during high flows. Rock is highly -weathered, faulted, and/or soft (Highly erodible rock).

Alluvium Streambeds (Note: Low channel slope and low flood flow velocity may allow a sandy or gravelly streambed to remain stable and should be coded accordingly):

A6 Little to no potential for scour under high water flow conditions. Minor scour holes may exist mid-channel (Highly Stable Alluvium: large native cobbles and boulders (not riprap) with small amounts of fine material in voids OR designed measures supported by H&H analysis to prevent scour. When countermeasures are used to correct a previous scour issue, code C8 or C7).

A5 No advanced scour over a long time period. Potential for scour exists only under high water velocity. Scour holes may exist in mid-channel. Near substructures only minor scour may be present (Moderately Stable Alluvium: cobbles, boulders (not rip rap), and gravel with some fine material).

A4 Potential for scour during ordinary high water. Advanced scour may be present or has occurred in the past near the substructure units, but repair methods or materials do not protect the structure from future occurrences (Unstable Alluvium: mixture of fine particles with some larger aggregate).

A3 High scour potential at all water velocities. Serious scour (undermining) may be present or has occurred in the past at the substructure units but the repair methods or materials to correct past scour do not protect the structure from future occurrences (Highly Unstable Alluvium: very small particles, including clays, silts, and/or fine sands).

IU07 Stream Bed Material Desc - Stream Bed Material Description

Inspection > Underwater > SCBI; Form G > SCBI Calculation Data

Description:

This item provides a description of the streambed material and/or countermeasure.

Procedure:

Enter description of the streambed and/or countermeasures identified in item IU06 in narrative form.

IU08 (Not Used - Reserved for Future Use)

IU09 (Not Used - Reserved for Future Use)

IU10 (Not Use - Reserved for Future Use)

IU11 NAB Loc - Near Abutment Location

Inspection > Underwater > SCBI; Form G > SCBI Calc. Data > SAR Calc. Data

Description:

This item is used to indicate whether the near abutment is located on the left or right side of the stream.

Procedure:

Select the appropriate location of the near abutment from the dropdown list. The left side of the stream is on the observer's left hand side as the observer stands on the bridge or in the stream facing downstream.

Coding:

- 1 Left, the near abutment is located on the left bank
- 2 Right, the near abutment is located on the right bank
- N Not Applicable

IU12 FAB Loc - Far Abutment Location

Inspection > Underwater > SCBI; Form G > SCBI Calc. Data > SAR Calc. Data

Description:

This item is used to indicate whether the far abutment is located on the left or right side of the stream.

Procedure:

Select the appropriate location of the far abutment from the dropdown list. The left side of the stream is on the observer's left hand side as the observer stands on the bridge or in the stream facing downstream.

Coding:

- 1 Left, the far abutment is located on the left bank
- 2 Right, the far abutment is located on the right bank
- N Not Applicable

IU13 US Left WW Presence - Upstream Left Wingwall Presence

Inspection > Underwater > SCBI; Form G > SCBI Calc. Data > SAR Calc. Data

Description:

This item indicates whether or not the upstream left wingwall is present.

Procedure:

Select "Yes" or "No" from the dropdown list to indicate whether the upstream left wingwall is present.

Coding:

- 0 No, the upstream left wingwall is not present
- 1 Yes, the upstream left wingwall is present
- 2 Not Necessary
- N Not Applicable

IU14 Condition - Condition of Upstream Left Wingwall

Inspection > Underwater > SCBI; Form G > SCBI Calc. Data > SAR Calc. Data

Description:

This item is used to indicate the condition of the upstream left wingwall, if present.

Procedure:

Select the code from the dropdown list that indicates the condition of the upstream left wingwall.

Coding:

- 1 Good – Wingwall has sufficient length, angle to flow and condition such that it provides adequate protection to the abutment.
- 2 Partial – Wingwall size, placement or condition is insufficient to provide adequate protection to the abutment.
- 3 Failed – Wingwall has evidence of movement or deterioration such that the wingwall is not providing adequate protection to the abutment, OR when the stream has significantly eroded behind the wingwall or there is significant loss of fill material from behind the wingwall.
- N Not Applicable

IU15 US Right WW Presence - Upstream Right Wingwall Presence

Inspection > Underwater > SCBI; Form G > SCBI Calc. Data > SAR Calc. Data

Description:

This item indicates whether or not the upstream right wingwall is present.

Procedure:

Select "Yes" or "No" from the dropdown list to indicate whether the upstream right wingwall is present.

Coding:

- 0 No, the upstream right wingwall is not present
- 1 Yes, the upstream right wingwall is present
- 2 Not Necessary
- N Not Applicable

IU16 Condition - Condition of Upstream Right Wingwall

Inspection > Underwater > SCBI; Form G > SCBI Calc. Data > SAR Calc. Data

Description:

This item is used to indicate the condition of the upstream right wingwall, if present.

Procedure:

Select the code from the dropdown list that indicates the condition of the upstream right wingwall.

Coding:

- 1 Good - Wingwall has sufficient length, angle to flow and condition such that it provides adequate protection to the abutment.
- 2 Partial - Wingwall size, placement or condition is insufficient to provide adequate protection to the abutment.
- 3 Failed - Wingwall has evidence of movement or deterioration such that the wingwall is not providing adequate protection to the abutment, OR when the stream has significantly eroded behind the wingwall or there is significant loss of fill material from behind the wingwall.
- N Not Applicable

IU17 Horiz Debris Start - Horizontal Debris Blockage Start

Inspection > Underwater > SCBI; Form G > SCBI Calc. Data > SAR Calc. Data

Description:

This item indicates the location along the span where the debris blockage starts, if present.

Procedure:

Enter the location along the span where the debris blockage starts in terms of percentage of span opening. The measurement is taken assuming the left abutment is the 0% point and the right abutment is the 100% point. The left abutment is on the observer's left hand side as the observer stands on the bridge or in the stream facing downstream. This field, along with items IU18, IU19, and IU20 should be used to justify the coding of item IN06 - Debris Potential.

Coding:

Location along the span where the debris blockage starts in terms of percentage of span opening, to the nearest percent. Use equivalent debris dimensions. See example in Figures 1 and 2 after item IU20.

IU18 Horiz Debris End - Horizontal Debris Blockage End

Inspection > Underwater > SCBI; Form G > SCBI Calc. Data > SAR Calc. Data

Description:

This item indicates the location along the span where the debris blockage ends, if present.

Procedure:

Enter the location along the span where the debris blockage ends in terms of percentage of span opening. The measurement is taken assuming the left abutment is the 0% point and the right abutment is the 100% point. The left abutment is on the observer's left hand side as the observer stands on the bridge or in the stream facing downstream. This field, along with items IU17, IU19, and IU20 should be used to justify the coding of item IN06 – Debris Potential.

Coding:

Location along the span where the debris blockage ends in terms of percentage of span opening, to the nearest percent. Use equivalent debris dimensions. See example in Figures 1 and 2 after item IU20.

IU19 Vert Debris Start - Vertical Debris Blockage Start

Inspection > Underwater > SCBI; Form G > SCBI Calc. Data > SAR Calc. Data

Description:

This item indicates the vertical location where the debris blockage starts, if present.

Procedure:

Enter the location where the debris blockage starts in terms of percentage of vertical clearance from the streambed. The measurement is taken assuming the streambed is the 0% point and the bottom beam is the 100% point. This field, along with items IU17, IU18, and IU20 should be used to justify the coding of item IN06 – Debris Potential.

Coding:

Location where the debris blockage starts in terms of percentage of vertical clearance from the streambed, to the nearest percent. Use equivalent debris dimensions. See example in Figures 1 and 2 after item IU20.

IU20 Vert Debris End - Vertical Debris Blockage End

Inspection > Underwater > SCBI; Form G > SCBI Calc. Data > SAR Calc. Data

Description:

This item indicates the vertical location where the debris blockage ends, if present.

Procedure:

Enter the location where the debris blockage ends in terms of percentage of vertical clearance from the streambed. The measurement is taken assuming the streambed is the 0% point and the bottom beam is the 100% point. This field, along with items IU17, IU18, and IU19 should be used to justify the coding of item IN06 – Debris Potential.

Coding:

Location where the debris blockage ends in terms of percentage of vertical clearance from the streambed, to the nearest percent. Use equivalent debris dimensions. See examples in Figures 1 and 2 after item IU20.

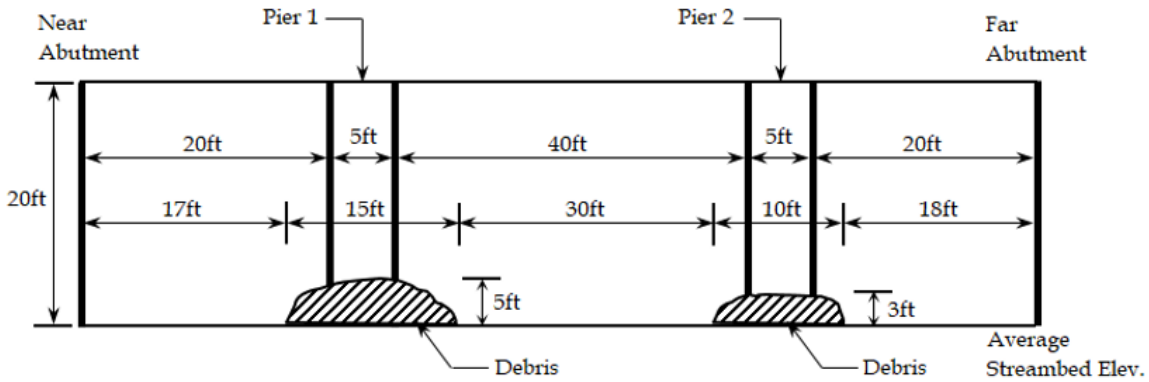


Figure 1 - Observed Debris

Total Opening Length = 20ft + 5ft + 40ft + 5ft + 20ft = 90ft
 Total Opening Height = 20ft
 Actual Debris Area = (5ft x 15ft) + (3ft x 10ft) = 105ft²
 Modified Length of Blockage = 15ft + 30ft + 10ft = 55ft
 Equivalent Debris Height = 105ft² / 55ft = 1.9ft

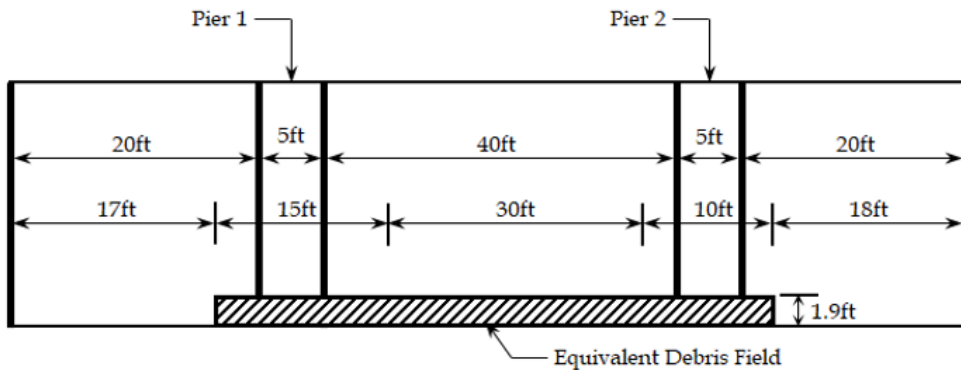


Figure 2 - Equivalent Debris

IU17 Horizontal Debris Blockage Start = 17ft / 90ft x 100% = 19%
 IU18 Horizontal Debris Blockage End = (17ft + 55ft) / 90ft x 100% = 80%
 IU19 Vertical Debris Blockage Start = 0%
 IU20 Vertical Debris Blockage End = (1.9ft / 20ft) x 100% = 10%

IU21 Type - Current Scour Countermeasure Type

Inspection > Underwater > SCBI > Current Countermeasures Detail; Form G > SCBI Calc. Data > Counter Measures

Description:

This item indicates the type of scour measure(s) or countermeasure(s) currently in place at the structure, if any. Scour measures are designed to resist scour and countermeasures are installed to fix a previous scour issue and are not designed.

Procedure:

Select the type of measure or countermeasure currently in place from the dropdown list.

Coding:

- | | | | |
|---|---------|---|---------------------|
| 0 | None | 3 | Guidebanks |
| 1 | Riprap | 4 | Concrete Encasement |
| 2 | Gabions | 5 | Others |

IU22 Location - Location of Current Scour Countermeasure

Inspection > Underwater > SCBI > Current Countermeasures Detail; Form G > SCBI Calc. Data > Counter Measures

Description:

This item is used to record the location where the current scour measure or countermeasure has been placed.

Procedure:

Select the location where the current scour measure or countermeasure has been placed from the dropdown list.

Coding:

- | | | | |
|---|---------------------------------|----|-----------------------------------|
| 1 | Upstream left wingwall (USLWW) | 6 | Far Abutment (FAB) |
| 2 | Upstream right wingwall (USRWW) | 7 | Left Bank (LB) |
| 3 | Near Abutment (NAB) | 8 | Right Bank (RB) |
| 4 | Pier | 9 | Downstream left wingwall (DSLWW) |
| 5 | Channel | 10 | Downstream right wingwall (DSRWW) |

IU23 Cond - Condition of Current Scour Countermeasure

Inspection > Underwater > SCBI > Current Countermeasures Detail; Form G > SCBI Calc. Data > Counter Measures

Description:

This item indicates the condition of the current scour measure or countermeasure selected in item IU21.

Procedure:

Select the appropriate condition code from the dropdown list.

Coding:

- 1 Good – The measure or countermeasure is performing as intended.
- 2 Partial – The measure or countermeasure is present but not performing as intended.
- 3 Failed – The measure or countermeasure is no longer present or is completely ineffective.

IU24 Sub Unit - Subunit Number

Inspection > Underwater > SCBI > Current Countermeasures Detail

Description:

This item is used to record the subunit number, if applicable, where the current scour measure or countermeasure is located.

Procedure:

Select the subunit number, if applicable, where the current scour measure or countermeasure is located. This item is limited to the piers and abutments previously defined for the structure.

Coding:

Subunit number where the current scour measure or countermeasure is located.

IU25 Location – Location of Potential Scour Countermeasure

Inspection > Underwater > SCBI > Potential Countermeasures Detail; Form G > SCBI Calc. Data > Counter Measures

Description:

This item is used to record the location where potential scour countermeasures may need to be placed to correct an actual or potential scour issue.

Procedure:

Select the location where potential scour countermeasures may need to be placed from the dropdown list.

Coding:

See item IU22 for the dropdown list.

IU26 Work Candidate

Inspection > Underwater > SCBI > Potential Countermeasures Detail; Form G > SCBI Calc. Data > Counter Measures

Description:

This item indicates the work candidate identifier from the list of work candidates for the structure.

Procedure:

Select the work candidate identifier from the dropdown list. The list is filtered by the Work Candidate status to exclude those candidates that have already been completed.

Coding:

22-E744803	Footing (Underpin)	11-C745301	Scour Hole (Backfill)
56-A745101	Abut. Slopewall (REP/REPL)	3-ECREMVG	Vegetation/Debris (Remove)
30-A705301	Streambed Paving (REP/CONSTR)	12-ECREMDP	Deposition (Remove)
13-B745301	Rock Protection	63-B745202	Apron/Cutoff Wall (REP/REPL)

IU27 SCBI Code

Inspection > Underwater > Sub Units; Form G > Sub Units > OSA and Condition Rating Details

Description:

This item indicates the SCBI code for an individual substructure unit.

Procedure:

This value is **automatically generated by the scour calculator**. If IU04b is checked, the scour calculator will automatically update this field when the IN fields are updated and saved in either BMS2 or iForms.

Coding:

Refer to Item 4A08 for coding descriptions.

IU28 SCBI Case

Inspection > Underwater > Sub Units; Form G > Sub Units > OSA and Condition Rating Details

Description:

This item indicates the case associated with the SCBI Code.

Procedure:

This value is **automatically generated by the scour calculator**. If IU04b is checked, the scour calculator will automatically update this field when the IN fields are updated and saved in either BMS2 or *iForms*.

Coding:

Refer to the Software User's Guide for Determining the Pennsylvania Scour Critical Indicator Code and Streambed Scour Assessment Rating for Roadway Bridges for coding descriptions.

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IN Inspection - Underwater Sub Units Tab

The Inspection - Underwater Scour - Subunits screen is used to view and edit sub unit scour information and details. It also provides the capability to automatically calculate the OSA (Observed Scour Assessment) and SAR (Scour Assessment Rating) for each sub unit. **Those fields marked with an “(SC)” are required for each substructure unit in order to re-calculate the Scour Critical Bridge Indicator (SCBI) value.**

IN01 Sub Unit - Abutment, Pier, Culvert, Wingwalls Referencing

Inspection > Underwater > Sub Units; Form G > Sub Units > OSA and Condition Rating Details

Description:

This item is used to reference the piers, abutments, culvert inlets and outlets, and wingwalls.

Procedure:

For piers, the 1st digit is coded as “P” and the last 3 digits represent the number of the pier being referred to. For abutments, culvert inlets and outlets, and wingwalls, enter the appropriate code.

Note:

Wingwalls should be coded with the attached abutment or culvert end unless the scour problem relates solely to the wingwall. However, wingwalls are not used to determine the bridges IU04 value.

Use abutment and pier codes to locate scour inside of single and multi-cell culverts without floors. Culverts with bottoms, should be coded as CIN and COU. Additional guidance provided in Fields 5D04 and 6A29.

Substructure units must be created in the Inventory – Structure Units screen (screen 5D) in order for them to appear in the dropdown list. Only substructure units within the 100-year flood plain should be added to the underwater screen.

Coding:

NAB	Near abutment	WNL	Wingwall, near left	WFR	Wingwall, far right
FAB	Far abutment	WNR	Wingwall, near right	CIN	Culvert inlet
P01-P99	Number of pier	WFL	Wingwall, far left	COU	Culvert outlet

IN02 Curr Ind - Previous/Current Inspection Indicator

Inspection > Underwater > Sub Units > Sub Unit Detail; Form G > Sub Units > Other Sub Unit Details

Description:

This item is used to indicate if underwater inspection data displayed in items IN01-IN24 is information collected on the current inspection date or is information from a previous inspection.

BMS2 displays the most recent inspection data for all substructure units simultaneously to allow the user a complete view of the bridge. Many times, however, not all of the substructure units are inspected at the same time.

Procedure:

For each substructure unit inspected on the new inspection date, enter the data for items IN01-IN24 by typing over existing data. Check the box in item IN02 to indicate that the data is current for the new inspection. If one or more fields are updated, this box should be checked.

For substructure units not inspected with the new inspection, IN02 is to remain unchecked to indicate that the data for that unit is from a previous inspection.

Coding:

Unchecked Previous inspection
 Checked Current inspection

Example:

Probing of abutments may be performed as part of an NBIS inspection, while the piers may be inspected by divers on a separate date. Item IN02 informs the viewer which items were performed as part of the current inspection and which were from a previous inspection.

IN03 Scour Rating - Observed Scour Rating

Inspection > Underwater > Sub Units > Sub Unit Detail; Form G > Sub Units > OSA and Condition Rating Details

Description:

This item is provided for the inspector’s on-site evaluation of each substructure unit’s risk of failure due to scour.

Procedure:

Select the code from the dropdown list that indicates current status of the unit regarding its vulnerability to failure due to scour.

Whenever a rating factor of “4” or below is determined for this item, item 1A02 (substructure condition rating) may need to be revised to reflect the severity of actual scour and resultant damage to the bridge. The substructure condition may need to be revised when advanced or serious scour is present which has compromised the structural integrity of the abutment (i.e., the scour has undermined the footing and reduced the bearing capacity or the scour has caused settlement and cracking in the substructure).

Coding:

For ratings 2, 1, and 0, codings are the same as for 4A08. For ratings 3 through 9, refer to the table below.

Code	ITEM NUMBER							
	IN04	IN05	IN06	IN07	IN08	IN09	IN10	IN11
	Changes Since Last Inspection	Scour Hole	Debris Potential	Substructure Scourability	Opening Adequacy/ Channel	Sediment Deposits	Alignment	Velocity/ Stream Slope
9	None	None	None	NF/P9/R9	Good	None	Good	Low
8	None	Minor	None	P8/C8/R8	Good	Minor	Good	Low
7	Minor	Minor	Minor	P7/C7/R7	Fair	Minor	Good	Medium
6	Minor	Advanced	Medium*	A6	Fair	Medium	Medium	Medium
5	Medium*	Advanced	High*	A5	Fair	High	Medium	High
4	Medium	Serious*	Present*	R4*/A4*	Poor*	High	Poor*	High
3	High*	Serious*	Present SC*	A3	Overtopping*	High	Poor	High
2	Bridge is scour critical, IMMEDIATE action is required.*							
1	Bridge is scour critical, bridge is CLOSED.*							
0	Bridge has failed due to scour.*							

Notes:

Rating considerations given in highest to lowest level of importance from left to right.

* If an item is so marked, it cannot be given a higher rating. If a value above the value selected for an item has an *, the IN03 value cannot exceed the asterisk value. For example, a structure with an IN07 value of a 3 cannot have an IN03 value greater than a 4.

Slashes (“/”) between coding descriptions, such as P7/C7/R7, indicate “OR” not “AND”. The overlapping of coding descriptions is intended to allow the inspector to differentiate between qualities of conditions at the site.

The coding guidance provided for a condition rating of a 2, 1, or 0 in the table for IN03 applies to Fields IN04 through IN11. For example, when coding IN05, if the scour is extremely severe and requires immediate action, the IN05 coding should be a 2 - Bridge is Scour Critical; immediate action is required. Coding's of 2, 1, or 0 are not specifically defined under each of these fields below.

IN04 Change Since Last Insp - Change Since Last Inspection (SC)

Inspection > Underwater > Sub Units > Sub Unit Detail; Form G > Sub Units > OSA and Condition Rating Details

Description:

This item indicates the amount of change in channel banks or stream bottom or appearance of scour holes since last inspection.

Procedure:

Select the code from the dropdown list that indicates the change in scour since the last inspection. Inspectors should provide justification for the coding in Field IN24.

Coding:

Changes have less affect regarding a sub-unit's vulnerability to failure due to scour when the sub-unit is founded on rock or piles, or has designed countermeasures in place. This is to be considered when selecting an appropriate code using the descriptions below:

None	No change through visual inspection or probing
Minor	No significant changes
Medium	Some changes are apparent, but pose no threat to the structure (i.e., no undermining or instability)
High	Significant changes which could affect the structure

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IN05 Scour Hole (SC)

Inspection > Underwater > Sub Units > Sub Unit Detail; Form G > Sub Units > OSA and Condition Rating Details

Description:

This item indicates the presence of scour found through visual inspection and/or probing.

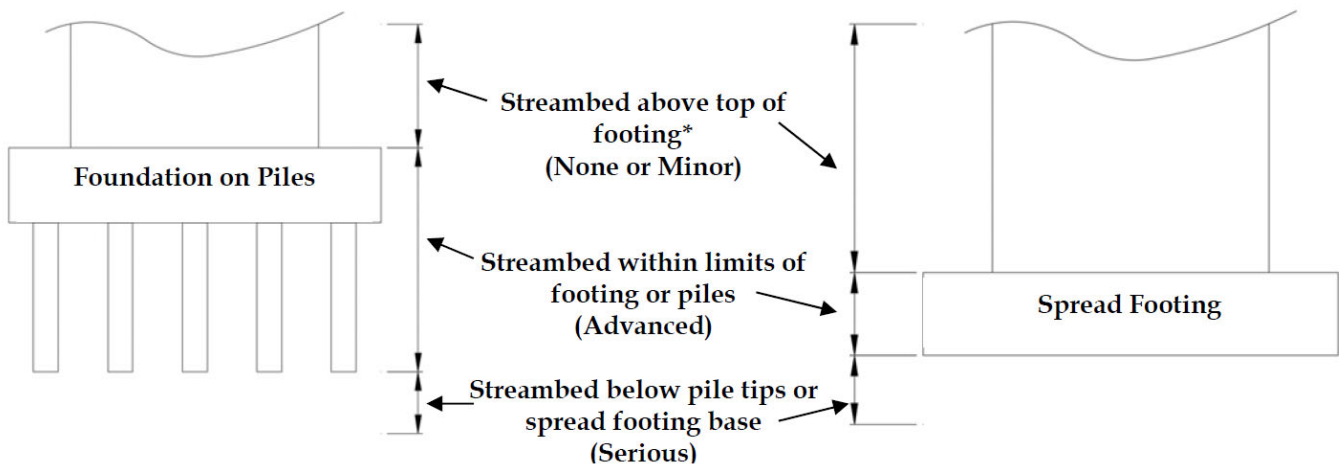
Procedure:

Select the code from the dropdown list that describes the scour condition at the sub-unit. Holes refilled with sediment dissimilar to the natural bed material should be considered as scour (see item IN15). Inspectors should provide justification for the coding in Field IN24.

Coding:

- None* Normal stream bed (no scour of the substructure unit within one bridge opening upstream and downstream).
- Minor* May exhibit slight holes or depressions. Footing not exposed.
- Advanced Footing exposed to very slightly undermined.
- Serious Significant undermining.

See Scour Definition Diagram for illustration of the above descriptions. If greater than 20% of the footing is undermined, code as a 2 or lower.



For substructure units founded on bedrock: The footing may have been built without any cover and may be coded as minor scour or none as appropriate.

Pile foundations: Pile bents where a change in the stable bed elevation is noted and footings on piles where undermining has partially exposed the piles should be reviewed with the design computations to determine safe depth of exposure.

*For the purpose of the scour calculator, none and minor are considered as the same condition.

IN06 Debris Potn - Debris Potential

Inspection > Underwater > Sub Units > Sub Unit Detail; Form G > Sub Units > OSA and Condition Rating Details

Description:

This item indicates the risk to the structure for blocking or partial blocking due to debris.

Procedure:

Select the code from the dropdown list that indicates the risk to the structure for blocking or partial blocking due to debris. If the opening is constricted, a greater potential for debris blockage may be present. Inspectors should provide justification for the coding in Items IU17, IU18, IU19, IU20, and IN24.

Coding:

None: Waterway opening capable of handling debris for small structures; no apparent debris sources.

Minor: Opening reasonably sized and debris can pass smoothly through the structure.

Medium: Increased risk of debris; apparent debris sources present.

High: High probability of debris OR debris present aligns with criteria set forth for a Priority Code 2.

Present Not SC: Debris presently blocking or partially blocking a significant portion of the adjoining span. (>30% of hydraulic opening for $4A08 \geq 4$ OR 10% to 20% of hydraulic opening for bridges with $4A08 \leq 3$ OR subunit with unknown foundation). These bridges require a High Priority Maintenance Item (Priority 1).

Present SC: Debris presently blocking or partially blocking a significant portion of the adjoining span. (>20% of hydraulic opening for $4A08 \leq 3$ OR subunit with unknown foundation). These bridges require a Critical Priority Maintenance Item (Priority 0).

IN07 Scourability - Substructure Scourability

Inspection > Underwater > Sub Units > Sub Unit Detail; Form G > Sub Units > OSA and Condition Rating Details

Description:

This item describes the ability of substructure foundation to resist scour.

Procedure:

Select the code from the dropdown list that describes the ability of substructure foundation to resist scour. Inspectors should provide justification for the coding in Field IN24.

Coding:

Consider these attributes in descending order, at each substructure unit. **Note:** x = integer. (1)

- NF No flow – No stream flow or tidal currents against substructure unit in excess of 1 fps is possible even during extreme HW.
- Px Piles – Footing is on piles or caissons. If no serious scour, rate P9. If serious scour is predicted, rate P8 when calculated pile stability is sufficient, rate P7 when stability is not calculated but appears sufficient. Applicable IN13 = B, C, D, E, F, G, H, I, J, or S.
- Cx Countermeasures at a substructure unit is non-designed and can include streambed paving (Cx as defined in IN15), gabion blankets, grout bags, rip rap, etc.). If countermeasures are effective, code C8 or C7. If not effective, code natural streambed material. Use item IN24 inspection findings, to document effectiveness. Cx is applicable on all IN13 foundation types. Countermeasures should only be coded as “Cx” if the countermeasures were installed to correct a previous issue. **For bridges with an H&H analysis and designed scour measures, the streambed material should be coded, ignoring the measure.**

- Rx** Rock - Footing (or concrete sub-footing) bears on competent Rock type x (see IN15 definition). If timber cribbing is between footing and on rock, code as "A6" to differentiate from footing directly on rock. Applicable foundation types IN13 = A.
- Ax** Alluvium - Footing bears on alluvium type "x" (see IN15 definition) or rock that is erodible or the erodibility has not been determined. Applicable foundation types IN13=K, R, L, P, X, or O.

Corresponding number value for "x":

If the substructure is founded on competent rock, piles, or designed scour measures are present, then the coding for this item is based on the foundation and is coded a 9, 8, or 7.

Otherwise the coding is based on the channel near the substructure unit and is dependent on several factors; the historical stability of the channel, the presence of scour holes at or near the substructure units, whether there is evidence of substructure settlement, and good engineering judgment.

If the channel is historically stable with no scour holes, and using good engineering judgment, code as high as a 5 or 6. Otherwise the channel is to be coded a 4 or lower. (Refer to Item IN15 for a more thorough description of A6, A5, A4, and A3).

IN08 Opening Adeq Channel - Opening Adequacy/Channel 🚧

Inspection > Underwater > Sub Units > Sub Unit Detail; Form G > Sub Units > OSA and Condition Rating Details

Description:

This item describes the capacity of waterway opening or approach channel to handle anticipated flows.

Procedure:

Select the code from the dropdown list that describes the capacity of waterway opening or approach channel to handle anticipated flows. Inspectors should provide justification for the coding in Field IN24.

Coding:

- | | |
|-------------|---|
| Good | Approach channel appears capable of handling design flows with little or no out of bank flow and the structure opening also appears adequate to pass design flood. |
| Fair | There appears to be only a slight chance of overtopping the roadway or the majority of the flow remains in the approach channel during major storms. |
| Poor | There is a significant probability of flows passing over the roadway behind the abutments, or there is a large portion of the flow in the overbank area upstream of the bridge. |
| Overtopping | High probability of overtopping of the structure. |

IN09 Sediment - Sediment Deposits 🚧

Inspection > Underwater > Sub Units > Sub Unit Detail; Form G > Sub Units > OSA and Condition Rating Details

Description:

This item describes the accumulation of fine material blocking or partially blocking the structure.

Procedure:

Select the code from the dropdown list that best describes the accumulation of fine material blocking or partially blocking the structure. Inspectors should provide justification for the coding in Field IN24.

Coding:

None	Channel clear, no blockage during low flow.
Minor	Slight accumulation of sediment un-vegetated, will probably be removed by next high water.
Medium	Partial span blockage* under low flow, minimal vegetation.
High	Full span blockage* for multi-span structures, sediments are well vegetated.

*Identify item on maintenance needs sheet.

IN10 Alignment

Inspection > Underwater > Sub Units > Sub Unit Detail; Form G > Sub Units > OSA and Condition Rating Details

Description:

This item describes the stream alignment at or near the structure.

Procedure:

Select the code from the dropdown list that describes the stream alignment at or near the structure. Inspectors should provide justification for the coding in Field IN24.

Coding:

Good	Relatively straight alignment, shallow skew angle for piers and abutments.
Medium	Smooth channel curve at or through the structure, skew angle in relation to the flood flow less than 30 degrees.
Poor	Sharp bend or turn, abutment or piers skewed against flood flow conditions. (For piers, shape of the ends is a significant factor. When selecting between higher or lower values of the same ranking, rounded shapes function best; square, blunt ends cause additional scour. Open bents have a greater potential than solid shaft piers.)

IN11 Velocity Stream Slope

Inspection > Underwater > Sub Units > Sub Unit Detail; Form G > Sub Units > OSA and Condition Rating Details

Description:

This item indicates the assumed flood flow velocity and stream slope.

Procedure:

Select the code from the dropdown list that indicates the assumed flood flow velocity and stream slope. Stream slope is to be determined by water surface elevations or low flow channel elevations one bridge width or 100' upstream and downstream of the structure. Also, consider restrictions which could accelerate the flow. Inspectors should provide justification for the coding in Field IN24.

Coding:

Low	Typically broad smooth flow, no sign of abrasion on the structure or banks, stream slope <1%.
Medium	Very little sediment remaining on channel bottom, some erosion on banks, stream slope $1\% \leq S < 5\%$.
High	Very rocky channel bottom with only large stones remaining, noticeable abrasion on structure and erosion of banks, stream slope $\geq 5\%$. Bridges exhibiting signs of pressure flow.

IN12 Pier/Abut Type - OSA Pier / Abutment Type (SC)

Inspection > Underwater > Sub Units > Sub Unit Detail; Form G > Sub Units > OSA and Condition Rating Details

Description:

This item indicates the type of abutment or pier for the current substructure unit to be used in the scour calculator on the OSA tab.

Procedure:

Select the type of abutment or pier for the current substructure unit from the dropdown list. Culverts without a bottom cannot have a coding of 10 - Other.

Coding:

Abutments:

- 1 Stub
- 2 Cantilever*
- 3 Gravity Concrete
- 4 Spill-through
- 5 Unknown Concrete
- 6 Stone Masonry
- 7 Piles / Bents / Integral
- 8 Concrete without piles / bents
- 9 Mechanically Stabilized Earth (MSE)*
- 10 Other*

Piers:

- 21 Timber
- 22 Steel
- 23 Concrete
- 24 Stone Masonry
- 25 Other

**Frame culverts (those without a bottom, 6A29 = 30 or 32) are to be coded as "2-Cantilever" abutment types. Culverts with a bottom (6A29 = 31, 33, 34, 35) are to be coded as "10-Other". An incorrect coding of this field will return an Item IU27 (Individual SCBI) value of 6, leading to an Item 4A08 value of "6". GRS Abutments are to be coded as "9-Mechanically Stabilized Earth (MSE)".*

IN13 Inv Found Type - PA Foundation Type (SC)

Inspection > Underwater > Sub Units > Sub Unit Detail; Form G > Sub Units > OSA and Condition Rating Details

Description:

This item indicates the foundation type at specific site(s).

Procedure:

Select the code from the dropdown list that represents the foundation type or material of the specific pier, abutment, culvert, or wingwall site referenced in item IN01. Inspectors should provide justification for the coding in Field IN24.

Notes:

This coding system is also used in items VD15 and VD17. Codings of R and S are provided to describe field observable conditions. Use only when more detailed or exact plan information does not exist.

Coding:

A	Footing on competent bedrock*	K	Footing or culvert with an integral bottom on erodible bedrock (such as claystone, clay shale, silt stone, shale, or weathered bedrock)
B	Cast-in-place concrete piles	L	Footing or culverts with an integral bottom on soil (sand-gravel, cobbles, silt, and clay)
C	Precast concrete piles	O	Other (describe in item IN24, inspection notes)
D	Prestressed concrete piles	P	Foundation type has been researched; information is unknown or not available with confidence
E	Steel H-piles	R	Footing on bedrock - erodibility cannot be determined
F	Steel pipe piles	S	Pile or caissons, if determined by probing
G	Timber piles	X	Information is not available at this time
H	Drilled caisson		
I	Deep water caisson		
J	Pedestals		

*For scour purposes, good quality rock or competent bedrock is defined as rock with no significant ongoing erosion and a low risk of failure during an extreme event.

IN14 Found Type - OSA Foundation Type (SC)

Inspection > Underwater > Sub Units > Sub Unit Detail; Form G > Sub Units > OSA and Condition Rating Details

Description:

This item indicates the foundation type at specific site(s) to be used in the scour calculator.

Procedure:

This field is **automatically filled in by the system** based on the value input for IN13.

Coding:

<u>IN14</u>	<u>Material</u>	<u>IN13 Coding</u>
1-	Bedrock	A
2-	Alluvium	R, K, L
3-	Piles/Caissons	B, C, D, E, F, G, H, I, J, S
4-	Other	O
5-	Not Observed	P, X
Blank		

The following combinations between abutments or piers and foundation types are invalid and will return a scour calculator code of "6". The inputs will need revised if one of these combinations is entered.

<i>Abutment Type (IN12)</i>	<i>Foundation Type (IN14)</i>
1 - Stub	2 - Alluvium
1 - Stub	5 - Not Observed
7 - Piles/Bents/Integral	1 - Bedrock
7 - Piles/Bents/Integral	2 - Alluvium
7 - Piles/Bents/Integral	5 - Not Observed
8 - Concrete w/o Piles/Bents	3 - Piles/Caissons
10 - Other	1 - Bedrock
10 - Other	2 - Alluvium
10 - Other	3 - Piles/Caissons
10 - Other	5 - Not Observed

<i>Pier Type (IN12)</i>	<i>Foundation Type (IN14)</i>
22 - Steel	1 - Bedrock
22 - Steel	2 - Alluvium
22 - Steel	5 - Not Observed
25 - Other	1 - Bedrock
25 - Other	2 - Alluvium
25 - Other	3 - Piles/Caissons
25 - Other	5 - Not Observed

IN15 Streambed Matl - Stream Bed Material (SC)

Inspection > Underwater > Sub Units > Sub Unit Detail; Form G > Sub Units > OSA and Condition Rating Details

Description:

This item correlates the stream bed material with its potential for scour for a particular substructure unit.

Procedure:

Select the code from the field dropdown list that correlates to the stream bed material with its potential for scour for a particular substructure unit. Inspectors should provide justification for the coding in Field IN24.

Coding:

Countermeasures-Non-designed scour protection (used to correct a previous scour issue):

C8 Streambed paved in good condition and adequate to resist scour (concrete, stone masonry, gabion blankets, or grout bags).

C7 Streambed paved, however, minor problems exist. Scour protection is adequate. Refer to Publication 15M (DM-4), Chapter 7, and Publication 408, Section 850, for the required minimum size of rip-rap to qualify as a countermeasure (concrete gabions, grout bags, or rip-rap in good condition).

The coding of C8 and C7 should be reserved for substructure units where a previous scour issue has been corrected with the placement of a countermeasure. FHWA considers countermeasures as a corrective action. Bridges with countermeasures require a Plan of Action and are considered to be Scour Critical Category D. For newer bridges when the SCBI Source is "C-Computed" and the conditions present match the designed condition, code the streambed material as "A6".

Bedrock Streambeds (not riprap) (refer to DM-4, Chapter 7, for additional guidance on types of bedrock):

R9 Minor scour may be present near substructure, but the chance of undermining is remote. Minor scour holes may exist away from the substructure units. Minor faulting or weathering may be present (Non-erodible rock).

R8 Minor scour may exist, but undermining is not present. Scour holes may exist away from the substructure units. Rock may be faulted, weathered and/or soft (Erodible rock).

R7 Advanced scour is present and is adjacent to substructures. However, there is little risk that scour could cause structure instability during high flows. Advanced weathering and/or faulting may be present (Erodible rock).

R4 Advanced or serious scour that could advance and threaten substructures during high flows. Rock is highly -weathered, faulted and/or soft (Highly erodible rock).

Alluvium Streambeds (Note: Low channel slope and low flood flow velocity may allow a sandy or gravelly streambed to remain stable and should be coded accordingly):

A6 Little to no potential for scour under high water flow conditions. Minor scour holes may exist mid-channel (Highly Stable Alluvium: large native cobbles and boulders (not riprap) with small amounts of fine material in voids OR designed measures supported by H&H analysis to prevent scour. When countermeasures are used to correct a previous scour issue, code C8 or C7).

A5 No advanced scour over a long-time period. Potential for scour exists only under high water velocity. Scour holes may exist in mid-channel. Near substructures only minor scour may be present (Moderately Stable Alluvium: cobbles, boulders (not rip rap), and gravel with some fine material).

A4 Potential for scour during ordinary high water. Advanced scour may be present or has occurred in the past near the substructure units, but repair methods or materials do not protect the structure from future occurrences (Unstable Alluvium: mixture of fine particles with some larger aggregate).

A3 High scour potential at all water velocities. Serious scour (undermining) may be present or has occurred in the past at the substructure units but the repair methods or materials to correct past scour do not protect the structure from future occurrences (Highly Unstable Alluvium: very small particles, including clays, silts and/or fine sands).

IN16 UW Insp Type - Underwater Inspection Type 🚧

Inspection > Underwater > Sub Units > Sub Unit Detail; Form G > Sub Units > Other Sub Unit Details

Description:

This item is used to record the underwater inspection performed.

Procedure:

Select the appropriate code from the dropdown list. Inspectors should provide justification for the coding in Field IN24.

Coding:

- A Underwater inspection performed by divers.
- B Underwater inspection (probing) performed by divers.
- C Inspection not completed. Underwater inspection by divers is required.
- D Inspection not completed. Return to site during low water to perform probing by inspector*.
- E No underwater inspection required. Probing performed by inspector during scheduled inspection.
- F Inspection completed. Returned to site during low water and probing performed by inspector*.
- G Probing inspection completed during a prior inspection. Time between probing inspections shall not exceed the values listed in Publication 238, Appendix IP-02E.
- S Partial inspection for USGS scour evaluation.

*The period of time to return to the bridge site must not exceed 90 days from the date of the scheduled inspection.

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IN17 Ob Scour Depth - Observed Scour Depth

Inspection > Underwater > Sub Units > Sub Unit Detail; Form G > Sub Units > Other Sub Unit Details

Description:

This item indicates the observed scour depth at or near a substructure unit at the time of inspection due to local scour, contraction scour, general scour or any combination thereof. General and contraction scour may be determined from the streambed profile, historic records, or visual indicators such as mud lines or bank cuts.

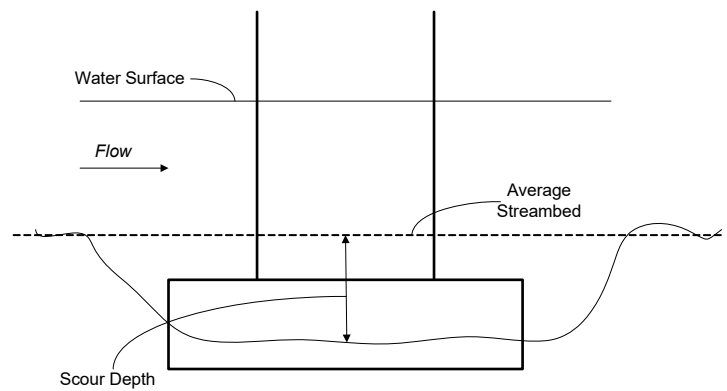
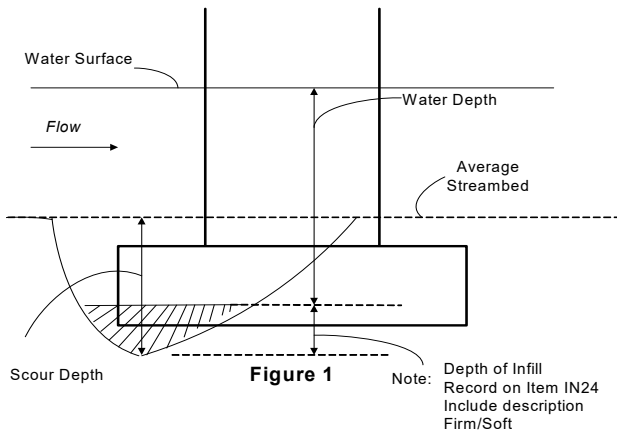
Procedure:

Enter the observed depth of scour to the nearest tenth of a foot at a substructure unit.

This value should be measured from the average stream bed depth to the bottom of the deepest scour hole.

For substructure units with defined scour holes, the observed scour depth should be measured from the average streambed in the vicinity of the substructure unit to the bottom of the deepest scour hole. (See Figure 1)

At substructure units where the streambed shows aggregation, degradation or local scour, it may be difficult to find the normal stream bed elevation immediately at the substructure unit. In these cases, elevation measurements should be taken upstream and downstream to determine the average streambed elevation and depth of scour. (see Figure 2)



Note: Figures 1 and 2 above illustrate the presence of local and contraction scour respectively. If the average streambed elevation at the bridge is lowered due to general scour, this amount must be added to the scour shown.

Coding:

The depth of scour recorded to the nearest tenth of a foot.

Example:

The observed scour depth is 6' 4":

6.3

IN18 Water Depth

Inspection > Underwater > Sub Units > Sub Unit Detail; Form G > Sub Units > Other Sub Unit Details

Description:

This item indicates maximum water depth at time of inspection at specific pier, abutment, culvert, and/or wingwall site(s).

Procedure:

Enter maximum water depth at a specific substructure unit to the nearest tenth of a foot.

Coding:

Maximum water depth recorded to the nearest tenth of a foot.

IN19 Movement Ind - Movement Indicator (SC)

Inspection > Underwater > Sub Units > Sub Unit Detail; Form G > Sub Units > Other Sub Unit Details

Description:

This checkbox field indicates whether or not there is any movement at the sub unit.

Procedure:

Check the box if there is movement at the sub unit. Otherwise, leave the box unchecked. Inspectors should provide justification for the coding in Field IN24.

Coding:

Unchecked	There has not been any movement at the sub unit
Checked	There has been movement at the sub unit

IN20 Scour / Undermine Ind - Scour / Undermining Indicator

Inspection > Underwater > Sub Units > Sub Unit Detail; Form G > Sub Units > Other Sub Unit Details

Description:

This checkbox field indicates whether or not scour is present at the substructure unit.

Procedure:

Check the box to indicate that scour is present at the substructure unit. Otherwise, leave the box unchecked. Inspectors should provide justification for the coding in Field IN24.

Coding:

Unchecked	Scour is not present
Checked	Scour is present

IN21 Countermeasures

Inspection > Underwater > Sub Units > Sub Unit Detail; Form G > Sub Units > Other Sub Unit Details

Description:

This checkbox field indicates whether or not effective scour measures or countermeasures are in place at a specific pier, abutment, culvert, and/or wingwall location.

Procedure:

Check the box to indicate that effective scour measures or countermeasures are in place at specific pier, abutment, culvert, and/or wingwall sites. Otherwise, leave the box unchecked. Inspectors should provide justification for the coding in Field IN24.

Coding:

Unchecked No effective scour measures or countermeasures exist, or none are required
 Checked Effective scour measures or countermeasures are in place

Note: Scour countermeasures can only be considered effective to counter scour if they have proven to remain stable under flood conditions.

IN22 100 yr Flood Sc. Depth - Calculated Scour Depth w/100 Year Flood

Inspection > Underwater > Sub Units > Sub Unit Detail; Form G > Sub Units > Other Sub Unit Details

Description:

This item indicates the 100 year flood calculated scour depth at specific pier, abutment, culvert, and/or wingwall sites.

Procedure:

Enter the 100 year flood calculated scour depth to the nearest tenth of a foot at specific pier, abutment, culvert, and/or wingwall sites.

Coding:

Depth of 100 year flood calculated scour recorded to the nearest tenth of a foot.

Examples:

The 100 year calculated scour depth is 6'4":

The 100 year calculated scour depth is 2'6":

IN23 500 yr Flood Sc. Depth - Calculated Scour Depth w/500 Year Flood

Inspection > Underwater > Sub Units > Sub Unit Detail; Form G > Sub Units > Other Sub Unit Details

Description:

This item indicates the 500 year flood calculated scour depth at specific pier, abutment, culvert, and/or wingwall sites.

Procedure:

Enter the 500 year flood calculated scour depth to the nearest tenth of a foot at specific pier, abutment, culvert, and/or wingwall sites.

Coding:

Depth of 500 year flood calculated scour recorded to the nearest tenth of a foot.

IN24 Notes - Inspection Notes

Inspection > Underwater > Sub Units > Sub Unit Detail; Form G > Sub Units > Other Sub Unit Details

Description:

This item is used to record a narrative description of inspection findings at specific pier, abutment, culvert, and/or wingwall sites.

Procedure:

Enter a narrative description of inspection findings at specific pier, abutment, culvert, and/or wingwall sites. The narrative should also be used to provide extent of undermining or scour, including dimensions. Refer to Publication 238, Appendix IP-02F for additional documentation requirements that are required during a bridge safety inspection and can be entered in this field for each specific substructure unit.

Inspectors should use this field to justify the coding of other IN fields.

Coding:

A narrative description of inspection findings.

Scour Coding Clarification for Bridges with Scour Measures/Countermeasures

The following clarification is provided to assist inspectors understanding how bridges should be coded when scour measures or countermeasures are present at a bridge. The guidance below follows the methodology of the scour calculator. Inspectors should not use the coding examples provided to simply correct their inputs for a desired SCBI rating.

A newly constructed bridge, with a footing designed properly for scour in accordance with DM-4 with an H&H analysis completed, should have IU03 = C - Computed if the bridge was built in accordance with the design plans. From the H&H analysis, the theoretical scour depth was calculated. If the scour depth is above the footing, the appropriate SCBI code would be an "8" and if the scour depth is within the footing, the appropriate SCBI code would be a "5". Bridges designed and constructed in accordance with DM-4 will generally be coded with an SCBI of "8"; however, there will be some cases when an SCBI of "5" will be appropriate (the intent of coding an SCBI of "5" when the footing has been designed to be exposed or footing has been designed with computed scour within the limits of the footing is to inform the inspectors that the foundation has been designed to allow some footing exposure and is still likely in a stable condition when footing exposure is observed). Code the IN fields as the field conditions have been observed. If there are scour measures (designed through an H&H), code IN15 Streambed Material as "A6" and check IN21. The scour measures should also be coded using the IU fields (IU21, IU22, and IU23). After entering this information, click the scour calculator to confirm the field inspection matches the designed condition. If they do not ($IU04 \leq 5$), review the inputs to determine if IU03 = C - Computed is still valid. Document any changes to coding in Item IN24.

Over time, the natural deterioration of the waterway will cause the IU03 to be changed from C - Computed to O - Observed because the field conditions no longer match the design conditions. If the scour measures are no longer in place or effective, IN15 Streambed Material should be changed from "A6" to the observed scour condition or actual material found beneath the previous scour measures.

When a bridge arrives at an SCBI value of a "4", planning for scour measures via an H&H analysis or countermeasures should begin with an appropriate maintenance item. Similarly, the urgency for scour measures or countermeasures increases when the SCBI value decreases to a "3" or below. If scour measures are installed, it would be appropriate to change the coding source from O - Observed to C - Computed because the theoretical scour depth has been recalculated with the scour measures in place (SCBI = "5" or "8"). If the bridge owner elects to install countermeasures, such as dumped rock, the SCBI rating will move to a "7" if the countermeasures have proven to be effective. Bridges with countermeasures in place still require a plan of action because the rock is not designed and possibly not the correct size to resist additional scour. When significant rain events occur, the countermeasures need to be evaluated to determine if they withstood the event.

As mentioned throughout the IN fields, when changes in coding are made by inspectors, the cause should be clearly documented in Item IN24. This is most important for IN04, IN05, IN13, IN15, and IN19 as these fields play into the scour calculator and are scrutinized by Districts, Central Office, and FHWA.

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IL Inspection - Underwater Other Tab

The Inspection - Underwater Scour - Other screen is used to view and edit waterway adequacy and underclearance information about a structure.

IL01 (Not Used - Reserved for Future Use)

*IL02 Risk of Overtopping

Inspection > Underwater > Other; Form J

Description:

This item indicates the overtopping frequency.

Procedure:

Select the overtopping frequency from the dropdown list. Leave this item blank if information is not available.

Coding:

- R Remote (greater than 100 years)
- S Slight (11 to 100 years)
- O Occasional (3 to 10 years)
- F Frequent (Less than 3 years)

*IL03 Traffic Delay

Inspection > Underwater > Other; Form J

Description:

This item indicates the severity of the traffic delay due to overtopping.

Procedure:

Select the code from the dropdown list that indicates the severity of the traffic delay for the structure.

Coding:

- I Insignificant - Minor inconvenience; highway passable in a matter of hours
- S Significant - Traffic delays of up to several days
- X Severe - Long term delays to traffic with resulting hardship

IL04 Func Class - Functional Classification

Inspection > Underwater > Other; Form J

Description:

This display only item indicates the Functional Classification of the highway.

Procedure:

This item is automatically entered by the system and required no input from the bridge inspector.

Coding:

<u>Rural</u>	<u>Urban</u>
01 Principal Arterial - Interstate	11 Principal Arterial - Interstate
02 Principal Arterial - Other	12 Principal Arterial - Other Freeways & Expressways
06 Minor Arterial	14 Other Principal Arterial
07 Major Collector	16 Minor Arterial
08 Minor Collector	17 Collector
09 Local	19 Local
NN Other	NN Other

IL05 Elevation - Maximum Known Water Surface Elevation

Inspection > Underwater > Other; Form J

Description:

This item is used to record the maximum known water surface elevation.

Procedure:

Enter the maximum known water surface elevation. If a maximum water surface elevation is not available, this item may be left blank.

Coding:

The maximum known water surface elevation to the nearest foot.

IL06 Date - Date of Maximum Known Water Surface Elevation

Inspection > Underwater > Other; Form J

Description:

This item is used to record the date of the maximum known water surface elevation.

Procedure:

Enter the year in which the maximum water surface elevation occurred. If a maximum water surface elevation is not available, this item may be left blank.

Coding:

Date in MM/DD/YYYY format:

- MM 2 digit month
- DD 2 digit day of month
- YYYY 4 digit year

IL07 New High Water - New Maximum Water Surface Status

Inspection > Underwater > Other; Form J

Description:

This item is used to display the status of a new high water mark.

Procedure:

Select the status of the new high water mark from the dropdown list.

Coding:

- | | |
|---|---------------------------|
| 0 | Not a new high water mark |
| 1 | New High water mark |

IL08 High Water Notes - Maximum Water Surface Notes

Inspection > Underwater > Other; Form J

Description:

This item is used to record notes relating to the high water mark.

Procedure:

Enter any notes relating the high water mark in narrative form.

Coding:

Notes relating the high water mark in narrative form.

IL09 Origin Desc - Underclearance Origin Description

Inspection > Underwater > Other > Underclearance Detail; Form G > Other

Description:

This item is used to record a description of the origin from where the horizontal clearance measurement starts.

Procedure:

Enter a description of the origin from where the horizontal clearance measurement starts in narrative form. The origin should typically start from the near abutment for the bridge and the lower numbered pier for each span of a multi-span bridge.

Coding:

Description of the origin from where the horizontal clearance measurement starts in narrative form.

IL10 Horz. - Horizontal Underclearance

Inspection > Underwater > Other > Underclearance Detail; Form G > Other

Description:

This item is used to record the horizontal distance from the origin described in item IL09 to the point of measurement.

Procedure:

Enter the horizontal distance from the origin described in item IL09 to the point of measurement.

Coding:

Horizontal distance from the origin described in item IL09 to the point of measurement to the nearest tenth of a foot.

IL11 Vert. - Vertical Underclearance

Inspection > Underwater > Other > Underclearance Detail; Form G > Other

Description:

This item is used to record the vertical underclearance corresponding to horizontal distance in item IL10.

Procedure:

Enter the vertical underclearance corresponding to horizontal distance in item IL10.

Coding:

Vertical underclearance to the nearest tenth of a foot corresponding to horizontal distance in item IL10.

IL12 Notes - Underclearance Notes

Inspection > Underwater > Other > Underclearance Detail; Form G > Other

Description:

This item is used to record notes about the underclearance measurements.

Procedure:

Enter any notes about the underclearance measurements in narrative form.

Coding:

Notes about the underclearance measurements in narrative form.

IL13 Worst Flood Event – Worst Flood Event Occurrence

Inspection > Underwater > Other; Form J

Description:

This field indicates the worst (i.e. most severe) flood event that has occurred at the site and resulted in a closure. This field also indicates whether overtopping occurred during that flood event.

Procedure:

Select the code from the dropdown list that indicates the correct status of the occurrence. If the approaches have overtopped, but not the bridge itself, code "C." Once a bridge has been overtopped, the coding should remain "CO" and it is not necessary to update IL14 for each subsequent event.

Coding:

- C Closure due to flooding has occurred but structure was not overtopped
- CO Closure due to flooding has occurred and structure was overtopped
- N Flooding has not been known to cause closure of the bridge

IL14 Worst Flood Event Date – Date of Worst Flood Event Occurrence

Inspection > Underwater > Other; Form J

Description:

This field is used to record the date that the worst (i.e. most severe) flood event coded in field IL13 occurred.

Procedure:

Enter the date in which the flood event coded in the IL13 field occurred. If the date is not known or unavailable, enter an estimate of the date that the event occurred. If such an event has never occurred at the site, this field should be left blank (i.e. 01/01/1901).

Coding:

Date in MM/DD/YYYY format:

- MM 2 digit Month
- DD 2 digit day of month
- YYYY 4 digit year

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ID Inspection - Signing Details

This screen allows the inspector to record any signing requirements for a structure during inspection. The screen is listed below Inspection Links. At the top of the screen is the select Inspection field.

ID01 Type of Sign

Inspection > Signings > Signings Detail; Form A > Signings in Field

Description:

This item indicates the sign type.

Procedure:

Select the type of sign from the dropdown list.

Coding:

0	Bridge	5	Vertical Clearance - Under
1	Bridge Weight Limit	6	One Lane Bridge
2	Except Combination	7	Narrow Bridge
3	One Truck at a Time	8	Hazard Clearance
4	Vertical Clearance - On	9	Other

ID02 Sign Needed?

Inspection > Signings > Signings Detail; Form A > Signings in Field

Description:

This item indicates whether or not the corresponding sign type is needed for the structure.

Procedure:

Select the code from the dropdown list to indicate whether or not the corresponding sign type is needed for the structure.

Coding:

0	Sign not needed
1	Sign needed

ID03 Sign Message

Inspection > Signings > Signings Detail; Form A > Signings in Field

Description:

This item is used to record the sign message.

Procedure:

Enter the sign message in narrative form.

ID04 Near Advance

Inspection > Signings > Signings Detail; Form A > Signing in Field

Description:

This item indicates the condition of the posting at the near advance.

Procedure:

Select the code from the dropdown list that indicates the condition of the posting at the near advance.

Coding:

D Signs damaged / incorrect
G Good - Signs properly installed
M Signs missing
N Not Applicable

ID05 Far Advance

Inspection > Signings > Signings Detail; Form A > Signing in Field

Description:

This item indicates the condition of the posting at the far advance.

Procedure:

Select the code from the dropdown list that indicates the condition of the posting at the far advance.

Coding:

D Signs damaged / incorrect
G Good - Signs properly installed
M Signs missing
N Not Applicable

ID06 Bridge Site Near

Inspection > Signings > Signings Detail; Form A > Signing in Field

Description:

This item indicates the condition of the posting at the bridge site near.

Procedure:

Select the code from the dropdown list that indicates the condition of the posting at the bridge site near.

Coding:

D Signs damaged / incorrect
G Good - Signs properly installed
M Signs missing
N Not Applicable

ID07 Bridge Site Far

Inspection > Signings > Signings Detail; Form A > Signing in Field

Description:

This item indicates the condition of the posting at the bridge site far.

Procedure:

Select the code from the dropdown list that indicates the condition of the posting at the bridge site far.

Coding:

D	Signs damaged / incorrect
G	Good - Signs properly installed
M	Signs missing
N	Not Applicable

ID08 Notes - Signing Notes

Inspection > Signings > Signings Detail; Form A > Signing in Field

Description:

This item is used to record notes about the signing at the structure.

Procedure:

Enter comments about the signing at the structure in narrative form.

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IC Inspection - Comments

This screen provides a mechanism for viewing and updating any inspection related notes for a particular structure inspection entered by the inspector on different *iForms* screens.

The screen is listed beneath the inspection links. By default the screen will display the comments in order of its availability. Users can erase a comment by clicking on the remove button after a particular comment type has been selected. At the top of the screen is the Select Inspection section. In the next section of the screen the user can click on a specific inspection comment type and modify the comment.

IC01 Comment Type - Inspection Comment Type

Inspection > Notes & Comments; Form P > Current Overall Inspection Notes

Description:

This item indicates the type of inspection comment for the structure.

Procedure:

Select the type of inspection comment from the dropdown list which are filtered based on structure type.

Coding:

Bridge and Other Comments

Description	Description
1 Approach Alignment	50 Embankment / Streambed Controls
2 Approach Roadway / Pavement	51 Drift, Other
3 Approach Roadway / Drainage	52 High Water Mark
4 Approach Roadway / Shoulders	53 Paint / Interior Beam / Girder
5 Approach Slab	54 Paint / Fascias
6 Relief Joint	55 Paint / Splash Zone: Truss /Girder
7 Safety Features / Bridge Railing	56 Paint / Truss
8 Safety Features / Transition	57 Paint / Bearings
9 Safety Features / Approach Guiderail	58 Paint / Other
10 Safety Features / Approach Rail Ends	59 Culvert / Top Slab
11 Deck Geometry	60 Culvert / Barrel
12 Deck	61 Culvert / Floor / Paving
13 Deck Drainage	62 Culvert / Headwall
14 Deck Wearing Surface	63 Culvert / Wings
15 Superstructure	64 Culvert / Settlement
16 Superstructure / Diaphragms	65 Culvert / Debris
17 Superstructure / Portals & Bracing	66 Waterway Adequacy
18 Superstructure / Drainage	67 Recalculate IR/OR Due to:
19 Substructure	68 Approach Roadway
30 Super / Girders	69 Bump at Bridge
31 Super / Floorbeams	70 Deck / Expansion Joint
32 Super / Stringers	71 Culvert
33 Super / Truss Mem	72 Controlling Lateral (for Item 4A11)
34 Super / Bearings	73 Actual Special Inspection Equipment required
35 Deck Top	74 Combustible Materials Under Bridge
36 Deck Underside	75 Inaccessible Inspection Location
45 Channel	220 Inventory Data Review
46 Banks	478 Inspection Acceptance - <i>iForms</i>
47 Streambed Movements	479 Inspection Acceptance - BMS2
48 Debris, Vegetation	480 Damage Inspection Notes
49 River (Stream) Control Devices	

Sign Comments

	Description
100	Sign / Column Base
101	Sign / Column
102	Sign / Guide Rail
103	Sign / Method of Access
104	Sign / Lights
105	Sign / Electrical System
106	Sign / Sign
107	Sign / Framework
108	Sign / Surface and Paint
109	Sign /Overall
110	Sign / Asset Tag

Wall Comments

	Description
130	Wall / Anchorage
131	Wall / Backfill
132	Wall / Wall
133	Wall / Drainage
134	Wall / Foundation
135	Wall / Parapets
136	Wall / Post
137	Wall / Panel
138	Wall / Overall
139	Wall / Architectural Treatments

Tunnel Comments

	Description
301	Tunnel / Ceiling Girders
302	Tunnel / Ceiling Panels
303	Tunnel / Ceiling Slabs
304	Tunnel / Columns & Piles
305	Tunnel / Conc Corrosion Prot Coat
306	Tunnel / Cross Passageway
307	Tunnel / Drain Pumping System
308	Tunnel / Egress Signs
309	Tunnel / Electrical Distribution System
310	Tunnel / Emergency Comm. System
311	Tunnel / Emer. Elec. Distribution Syst.
312	Tunnel / Emergency Generator System
313	Tunnel / Emergency Lighting Fixture
314	Tunnel / Emergency Lighting System
315	Tunnel / Expansion Joint
316	Tunnel / Fans
317	Tunnel / Fire Detection System
318	Tunnel / Fire Protection System
319	Tunnel / Fire Protective Coating
320	Tunnel / Gaskets
321	Tunnel / Hangers and Anchorages
322	Tunnel / Interior Walls
323	Tunnel / Invert Girders
324	Tunnel / Invert Slabs
325	Tunnel / Lane Signal
326	Tunnel / Lane Signal Fixture
327	Tunnel / Liners
328	Tunnel / Pedestrian Railing
329	Tunnel / Portal (General)
330	Tunnel / Pumps
331	Tunnel / Portal Beams/Girders
332	Tunnel / Slab-on-Grade
333	Tunnel / Steel Corrosion Prot. System
334	Tunnel / Traffic Barrier
335	Tunnel / Traffic Sign
336	Tunnel / Tunnel Lighting Fixture
337	Tunnel / Tunnel Lighting System

	Description
338	Tunnel / Tunnel Operations and Security Syst.
339	Tunnel / Variable Message Boards
340	Tunnel / Ventilation System
341	Tunnel / Wearing Surface
400	Tunnel / Portal Fascia Surface
401	Tunnel / Portal Panel Underside
402	Tunnel / Portal Retaining Walls
403	Tunnel / Portal Retaining Walls Backfill
404	Tunnel / Portal Retaining Walls Drainage
405	Tunnel / Portal Retaining Walls Foundation
406	Tunnel / Portal Retaining Walls Settlement
407	Tunnel / Portal Retaining Walls Overall
408	Tunnel / Portal Building Roof General
409	Tunnel / Portal Building Roof Drainage
410	Tunnel / Portal Building Roof Flashing
411	Tunnel / Portal Building Roof Downspouting
412	Tunnel / Portal Building Roof Drainage Outlet
413	Tunnel / Portal Building Roof Girders
414	Tunnel / Portal Building Roof Floorbeams
415	Tunnel / Portal Building Roof Beam Seats
416	Tunnel / Portal Building Roof Soffit
417	Tunnel / Portal Building Floor (General)
418	Tunnel / Portal Building Floor Girders
419	Tunnel / Portal Building Floor Floorbeams
420	Tunnel / Port. Bldg Floor Supports/Seat Conn
421	Tunnel / Portal Building Floor Slab Soffit
422	Tunnel / Portal Building Floor Drainage
423	Tunnel / Portal Building Facilities - Plumbing
424	Tunnel / Portal Building Facilities - Drainage
425	Tunnel / Portal Building Facilities - Fixtures
426	Tunnel / Portal Building Facilities - HVAC
427	Tunnel / Portal Building Facilities - Security
428	Tunnel / Emer. Dist. System Cable Conduit
429	Tunnel / Emer. Comm. Syst. Portal Bldg. Signs
430	Tunnel / Emer. Comm. Syst. Controller
431	Tunnel / Emer. Comm. Syst. Speakers
432	Tunnel / Emer. Comm. Syst. Input Equipment

Tunnel Comments (continued)

Description	Description
433 Tunnel / Em. Elec. Dist. Sys. Generator	456 Tunnel / Damper Motors
434 Tunnel / EEDS Gen. Coolant System	457 Tunnel / Damper Controllers
435 Tunnel / EEDS Gen. Control Equip.	458 Tunnel / Air Quality Monitoring Equipment
436 Tunnel / EEDS Control panels	459 Tunnel / Fire Hydrants
437 Tunnel / EEDS Batteries and Chargers	460 Tunnel / Fire Prot. Syst. Main Fire Pump
438 Tunnel / EEDS Main Fuel Storage Tank	461 Tunnel / Fire Prot. Syst. Jockey Pump
439 Tunnel / EEDS Day Fuel Tank	462 Tunnel / Fire Prot. Syst. Dry Pipe Valves
440 Tunnel / EEDS Circulating Fuel Pumps	463 Tunnel / FPS Valves and Tamper Switches
441 Tunnel / EEDS Fuel Tank Ventilation	464 Tunnel / FPS Storage Tanks
442 Tunnel / EEDS Fuel Tank Sensors	465 Tunnel / FPS Tunnel Standpipe
443 Tunnel / EEDS Exhaust Manifold	466 Tunnel / FPS Pressure/Air Release Valves
444 Tunnel / EEDS Ex. Louver/Damper	467 Tunnel / FPS System Backflow Protection
445 Tunnel / EEDS Supply Louv./Damper	468 Tunnel / FPS Hose Stations
446 Tunnel / OpSec CCTV	469 Tunnel / FPS Hose Reels
447 Tunnel / OpSec Cell Phone Antennas	470 Tunnel / Tunnel Sprinkler System
448 Tunnel / OpSec Door Access	471 Tunnel / Portal Building Sprinkler System
449 Tunnel / OpSec Controller	472 Tunnel / Fire Department Connections
450 Tunnel / OpSec Radio	473 Tunnel / Drain. & Pump. Sys. Pump Motors
451 Tunnel / Fan Motors	474 Tunnel / Drain. & Pump. Sys. Pump Controllers
452 Tunnel / Fan Motor Controllers	475 Tunnel / Drain. & Pump. Sys. Piping
453 Tunnel / Airway	476 Tunnel / Drain. & Pump. Sys. Drains and Inlets
454 Tunnel / Sound Attenuators	477 Tunnel / Drain. & Pump. Sys. Water Treatment
455 Tunnel / Dampers	

IC02 Comments - Inspection Comments

Inspection > Notes & Comments

Description:

This item is used to record inspection comments.

Procedure:

Enter comments about the inspection in narrative form. The "Comments Continued" field should be used when the comment is larger than can be entered into Field 1.

IC03 Substructure Unit

Inspection > Notes & Comments

Description:

This item indicates the substructure unit for which comments will be recorded in item IC05.

Procedure:

Select the substructure unit for which comments will be recorded from the dropdown list.

IC04 Comment Type - Substructure Comment Type

Inspection > Notes & Comments

Description:

This item indicates the type of comment for the substructure unit.

Procedure:

Select the type of comment from the dropdown list.

Coding:

20	Abutment / Backwall	29	Abutment / Wall Drainage
21	Abutment / Bridge Seats	38	Abutment / Combustible Material
22	Abutment / Cheekwalls	39	Pier / Combustible Material
23	Abutment / Stem	40	Pier
24	Abutment / Wings	41	Pier / Bridge Seats
25	Abutment / Footing	42	Pier / Cheekwalls
26	Abutment / Piles	43	Pier / Columns/Stems
27	Abutment / Settlement	44	Pier / Settlement
28	Abutment / Embankment Slopewall		

IC05 Comments - Structure Unit Comments

Inspection > Notes & Comments

Description:

This item is used to record comments about the substructure unit selected in item IC03.

Procedure:

Enter comments about the substructure unit selected in item IC03 in narrative form. The "Comments Continued" field should be used when the comment is larger than can be entered into Field 1.

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IM Inspection - Maintenance

The Inspection Maintenance Screen is used to store recommended work candidates for a structure and to record completed maintenance.

All proposed work items (bridge, element and flexible actions) will be listed on the Proposed Maintenance screen. This screen allows Districts to create work notifications in SAP for county maintenance crews by following a series of simple steps. BMS2 supplies SAP with minimum information to initiate the notification which after appropriate review and approval, becomes a work order. Once the bridge maintenance work is completed and the information is updated in SAP, BMS2 retrieves select information from SAP and stores it on the Completed Maintenance screen.

BMS2 Procedure for creating Bridge work notifications in SAP:

1. Navigate to the Proposed Maintenance screen for the desired bridge.
2. Select the desired maintenance activity that is to be sent to SAP.
3. Set Item IM07, Status, to "1 - Work planned/Dept"
4. Set Item IM08, Target Year, to the applicable year
5. Set Item IM11, Work Assign, to "0 - Agency".
6. Save the changes
7. Ensure that the maintenance activity is highlighted and click on the "Submit to SAP" button. Item IM07, Status, will change automatically to "3 - Work Sent to SAP".
8. Once Item IM07 displays "3-Work Sent to SAP", the maintenance activity will appear in SAP/Plant Maintenance as a notification the next day. Further information and approval is necessary within SAP to develop a work order.

Only planned maintenance work should be submitted to SAP. Districts should confirm that the notification has been sent to SAP and is ready to be generated into a work order.

When maintenance work is completed and a work order is closed in SAP/Plant Maintenance, BMS2 will receive notification. Item IM07, Status, will change to "5 - Completed/Dept" and no additional review is required. The date completed, actual quantities and costs (BMS2 Items IM14, IM18 and IM19) will be taken from SAP/Plant Maintenance.

When maintenance work is completed by contractor forces, Item IM07, Status, must be changed to "6 - Completed/Contr". Users must also update Item IM04, Estimated Quantity and Item IM10, Estimated cost with actual values on the Proposed Maintenance screen. Once changes to these fields have been made and saved, the work item will be stored in the Completed Maintenance screen.

When maintenance work has been superseded due to major rehabilitation or replacement work, then Item IM07, Status, must be changed to "7 - superseded ", and the actual date of the work should be coded in Item IM14.

Users may update completed maintenance work items by checking the "Show Completed Work Candidates" checkbox on the Proposed Maintenance screen. Completed maintenance work items will appear and users may then edit information as needed.

IM01 Scope

Other > Proposed Maintenance > Proposed Maintenance Detail; Form M

Description:

This display only item indicates the type of work candidate.

Procedure:

Select the type of work candidate from the dropdown list.

Coding:

Bridge	Structure replacement or improvement actions
Element	Preservation action on a particular element
Flexaction	Agency defined flexible action
	(All recommendations from bridge inspectors must be Flexactions)

Notes:

- 1) All BMS maintenance items from the old BMS AH screen have been converted as Flexaction work candidates.

IM02 Element

Other > Proposed Maintenance > Proposed Maintenance Detail

Description:

This item is only active for Element work candidates and used to identify the element to which the work candidate applies.

Procedure:

Select the element to which the work candidate applies from the dropdown list.

Coding:

N/A will be displayed for Bridge and Flexaction work candidates. For Element work candidates, the dropdown list provides all available BMS2 elements used to define a bridge structure. Refer to Appendices H, I & J for guidance on coding element quantities.

IM03 Action

Other > Proposed Maintenance > Proposed Maintenance Detail; Form M

Description:

This item is used to select the action that should be performed for the work candidate.

Procedure:

Select the action that should be performed for the work candidate from the dropdown list. This is a required item for any maintenance activity recommended by an inspector. The number in front of the Flexaction selection represents the number assigned in the applet software.

Only one priority code may be entered for each maintenance activity. In the case of multiple instances of the same maintenance activity, enter only the highest priority code.

Coding:

When IM01, Scope is "Bridge", the following actions are available to choose from:

ID	Description
11	Replace - Replace entire structure
12	Repl Super - Replace Superstructure
13	Remove - Remove entire structure
21	Widen - Widen structure
22	Raise - Raise superstructure
23	Strengthen - Strengthen structure
24	Scour - Install scour protection (Do not use)
25	Seismic - Install seismic retro-fit
26	Fatigue - Install fatigue retro-fit
50	Crib - Install Cribbing
60	Other - Other bridge actions

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When IM01, Scope is "Flex Action", the following actions are available to choose from:

Description of Activity	Identifier (IM03)	Unit	Category*	Description of Activity	Identifier (IM03)	Unit	Category*
APPROACH ROADWAY				TRUSS			
Pavement (Patch/Raise)	40-RDPAVMT	SY	Other	Members (Strengthen/Rep/Repl)(2)	36-A744701	EA	Bridge
Pavement Relief Jt. (Rep/Repl)	41-RDRLFJT	SY	Other	Portal (Modify)	82-B744701	EA	Bridge
Shoulders (Repair/Reconstr)	46-RDSHLDR	SY	Other	Members (Tighten/Flame shorten)	71-C744702	EA	Bridge
Drainage-Off Bridge (Improve)	47-RDDRAIN	EA	Other	PAINTING			
Guide Rail (Connect to Bridge)	27-RDGDRL	EA	Other	Superstructure - Spot	57-A743201	EB	Bridge
Load Limit Signs (Replace)	70-RDLDSGN	EA	Other	Substructure - Spot	16-B743201	EB	Bridge
Clearance Signs (Replace)	51-RDCLSGN	EA	Other	Superstructure - Full	65-C743201	EB	Bridge
Cut Brush to Clear Signs	24-RDBRUSH	EA	Other	Substructure - Full	79-D743201	EB	Bridge
Approach Slab (Replace)	64-A744201	SY	Other	ABUTMENT - WING - PIER, etc.			
CLEAN/FLUSH				Backwall (Rep/Repl)	38-A744801	CY	Bridge
Deck	23-A743101	EB	Cleaning	Abutments (Repair)	28-B744802	CY	Bridge
Scupper/Down spouting	1-B743101	EB	Cleaning	Wing (Rep/Repl)	15-C744802	CY	Bridge
Bearing/Bearing Seat	8-C743102	EB	Cleaning	Piers (Repair)	32-D744802	CY	Bridge
Steel-Horizontal Surfaces	34-D743102	EB	Cleaning	Footing (Underpin)	22-E744803	CY	Bridge
Brush Clearing	92-BRSHCLR	EB	Cleaning	Masonry (Repoint)	19-F744804	LF	Bridge
DECK				Abut. Slopewall (Rep/Repl)	56-A745101	SY	Other
Bitum. Deck W. Surf (Rep/Repl)	10-BITWRGS	SY	Bridge	Abut. Slopewall (Construct New)	43-B745102	CY	Other
Timber Deck (Rep/Repl)	35-B744301	SY	Bridge	Pile Repair	67-A745901	EA	Bridge
Open Steel Grid (Rep/Repl)	37-C744302	SY	Bridge	SCOUR CONTROL			
Concrete Deck (Repair)	6-D744303	SY	Bridge	Stream Bed Paving (Rep/Constr)	30-A745301	CY	Bridge
Concrete Sidewalk (Repair)	39-E744303	SY	Bridge	Rock Protection	13-B745301	CY	Bridge
Concrete Curb/Parapet (Rep)	21-F744303	SY	Other	Scour Hole (Backfill)	11-C745301	CY	Bridge
Install New PPC Overlay	97-New PPC Overlay	SY	Bridge	Stream Deflector (Rep/Constr)	55-D745302	CY	Bridge
Install New Epoxy Overlay	98-New Epoxy Overlay	SY	Bridge	Vegetation/Debris (Remove)	3-ECREMGV	CY	Bridge
DECK JOINTS				Deposition (Remove)	12-ECREMDP	CY	Bridge
Reseal	2-A743301	LF	Bridge	CULVERT			
Repair/Reseal	4-A744101	LF	Bridge	Headwall/Wings (Rep/Repl)	29-A745201	SY	Bridge
Compression Seal (Rep/Rehab)	33-B744102	LF	Bridge	Apron/Cutoff Wall (Rep/Repl)	63-B745202	SY	Bridge
Modular Dam (Rep/Rehab)	53-C744102	LF	Bridge	Barrel (Repair)	48-C745203	SY	Bridge
Steel Dams (Rep/Rehab)	20-D744102	LF	Bridge	SIGN STRUCTURES			
Other Types (Rep/Rehab)	9-E744102	LF	Bridge	Sign Struct (Rep/Repl)	75-SSSTRUC	EA	Other
RAILING				Sign Attach (Rep/Repl)	74-SSATTAC	EA	Other
Bridge/Parapet (Rep/Repl)	7-RLGBRPR	LF	Bridge	Sign Str Surface Spot	86-SSSURVS	SF	Other
Struct Mount (Rep/Repl)	17-RLGSTRM	LF	Bridge	Lighting Sys (Rep/Repl)	73-SSLIGHT	EA	Other
Pedestrian (Rep/Repl)	18-RLGPEDN	LF	Bridge	Sign Access (Rep/Repl)	87-SSACCES	EA	Other
Median Barrier (Rep/Repl)	58-RLGMEDB	LF	Other	Struct Connection (Repl)	78-SSCONNT	EA	Other
DECK DRAIN				Foundation (Rep/Repl)	72-SSFOUND	EA	Other
Scupper Grate (Replace)	52-DRNGRAT	EA	Bridge	RETAINING WALLS			
Drain/Scupper (Install)	31-B744401	EA	Bridge	Retaining Wall (Rep/Repl)	77-RTWALLR	LF	Other
Down spouting (Rep/Repl)	14-C744402	EA	Bridge	Facing (Rep/Repl)	83-RTFACNG	SY	Other
BEARINGS				Regrading	88-RTGRADE	CY	Other
Lubricate	66-A743501	EA	Other	Drainage (Rep/Repl)	85-RTDRAIN	EA	Other
Steel (Rep/Rehab)	44-A744501	EA	Other	Tie Back Connections (Rep/Repl)	84-RTTIEBK	EA	Other
Steel (Replace)	61-B744501	EA	Bridge	APPLY PROTECTIVE COATING			
Expansion (Reset)	68-C744502	EA	Bridge	Deck/Parapets/Sidewalk	80-A743401	SY	Other
Pedestal/Seat (Reconstruct)	45-D744503	EA	Bridge	Substructure	5-B743401	SY	Other
TIMBER				CONSTRUCT TEMPORARY			
Stringer (Rep/Repl)	62-A744601	EA	Bridge	Support Bent	59-A745401	SY	Other
Other Members (Rep/Repl)	60-B744601	EA	Bridge	Pipes	81-B745401	EB	Other
STEEL				Bridge	76-C745401	EB	Other
Stringer (Rep/Repl)	25-A744602	EA	Bridge	CONSTRUCT NEW			
Floorbeam (Rep/Repl)	50-B744602	EA	Bridge	Bridge	90-A742501	EB	Other
Girder (Repair)	49-C744602	EA	Bridge	Culvert	91-B742501	EB	Other
Diaph/Lat. Bracing (Rep/Repl)	54-D744602	EA	Bridge	COMBUSTIBLE MATERIAL REVIEW			
REIN. CONC./PRESTRESSED CONC.				On-Site Review Required by PennDOT	96-Combust	EB	Other
Stringer (Rep/Repl)	42-A744603	EA	Bridge	RECOVERABLE BRIDGE DAMAGE			
Diaphragm (Rep/Repl)	69-B744603	EA	Bridge	Recoverable Bridge Damage - Known	99-RECDAMG	EB	Other
Other Members (Rep/Repl)	26-C744603	EA	Bridge	Accident			

* Bridge = Bridge Maintenance
Tunnel = Tunnel Maintenance

Cleaning = Bridge Cleaning
Other = Other Structural Actions

Available maintenance items by service type:

Maintenance Items		Bridge	Sign/Light	Walls	Tunnels
APPROACH ROADWAY					
Pavement (Patch/Raise)	40-RDPAVMT	X			X
Pavement Relief Jt. (Rep/Repl)	41-RDRLEJT	X			X
Shoulders (Repair/Reconstr)	46-RDSHLDR	X			X
Drainage-Off Bridge (Improve)	47-RDDRAIN	X		X	X
Guide Rail (Connect to Bridge)	27-RDGDREL	X	X	X	X
Load Limit Signs (Replace)	70-RDLDSGN	X			X
Clearance Signs (Replace)	51-RDCLSGN	X		X	X
Cut Brush to Clear Signs	24-RDBRUSH	X	X	X	X
Approach Slab (Replace)	64-A744201	X			X
CLEAN/FLUSH					
Deck	23-A743101	X			X
Scupper/Down spouting	1-B743101	X			X
Bearing/Bearing Seat	8-C743102	X			
Steel-Horizontal Surfaces	34-D743102	X	X		
Brush Clearing	92-BRSHCLR	X	X	X	
DECK					
Bitum. Deck W. Surf (Rep/Repl)	10-BITWRGS	X			
Timber Deck (Rep/Repl)	35-B744301	X			
Open Steel Grid (Rep/Repl)	37-C744302	X			
Concrete Deck (Repair)	6-D744303	X			
Concrete Sidewalk (Repair)	39-E744303	X			
Concrete Curb/Parapet (Rep)	21-F744303	X			
Install New PPC Overlay	97-New PPC Overlay	X			
Install New Epoxy Overlay	98-New Epoxy Overlay	X			
DECK JOINTS					
Reseal	2-A743301	X			
Repair/Reseal	4-A744101	X			
Compression Seal (Rep/Rehab)	33-B744102	X			
Modular Dam (Rep/Rehab)	53-C744102	X			
Steel Dams (Rep/Rehab)	20-D744102	X			
Other Types (Rep/Rehab)	9-E744102	X			
RAILING					
Bridge/Parapet (Rep/Repl)	7-RLGBRPR	X	X	X	X
Struct Mount (Rep/Repl)	17-RLGSTRM	X		X	X
Pedestrian (Rep/Repl)	18-RLGPEDN	X		X	X
Median Barrier (Rep/Repl)	58-RLGMEDB	X	X		X
DECK DRAIN					
Scupper Grate (Replace)	52-DRNGRAT	X		X	X
Drain/Scupper (Install)	31-B744401	X		X	X
Down spouting (Rep/Repl)	14-C744402	X		X	
BEARINGS					
Lubricate	66-A743501	X			
Steel (Rep/Rehab)	44-A744501	X			
Steel (Replace)	61-B744501	X			
Expansion (Reset)	68-C744502	X			
Pedestal/Seat (Reconstruct)	45-D744503	X			
TIMBER					
Stringer (Rep/Repl)	62-A744601	X			
Other Members (Rep/Repl)	60-B744601	X		X	
STEEL					
Stringer (Rep/Repl)	25-A744602	X			
Floorbeam (Rep/Repl)	50-B744602	X			
Girder (Repair)	49-C744602	X			
Diaph/Lat. Bracing (Rep/Repl)	54-D744602	X			
REINF. CONC./PRESTRESSED CONC.					
Stringer (Rep/Repl)	42-A744603	X			
Diaphragm (Rep/Repl)	69-B744603	X			
Other Members (Rep/Repl)	26-C744603	X			

Maintenance Items		Bridge	Sign/Light	Walls	Tunnels
TRUSS					
Members (Strengthen/Rep/Repl)(2)	36-A744701	X			
Portal (Modify)	82-B744701	X			
Members (Tighten/Flame shorten)	71-C744702	X			
PAINTING					
Superstructure - Spot	57-A743201	X			X
Substructure - Spot	16-B743201	X			X
Superstructure - Full	65-C743201	X			X
Substructure - Full	79-D743201	X			X
ABUTMENT - WING - PIER, etc.					
Backwall (Rep/Repl)	38-A744801	X			
Abutments (Repair)	28-B744802	X			
Wing (Rep/Repl)	15-C744802	X			
Piers (Repair)	32-D744802	X			
Footings (Underpin)	22-E744803	X		X	
Masonry (Repoint)	19-F744804	X			
Abut. Slopewall (Rep/Repl)	56-A745101	X			
Abut. Slopewall (Construct New)	43-B745102	X			
Pile Repair	67-A745901	X		X	
SCOUR CONTROL					
Stream Bed Paving (Rep/Constr)	30-A745301	X		X	
Rock Protection	13-B745301	X		X	
Scour Hole (Backfill)	11-C745301	X		X	
Stream Deflector (Rep/Constr)	55-D745302	X		X	
Vegetation/Debris (Remove)	3-ECREMGV	X		X	
Deposition (Remove)	12-ECREMDP	X		X	
CULVERT					
Headwall/Wings (Rep/Repl)	29-A745201	X			
Apron/Cutoff Wall (Rep/Repl)	63-B745202	X			
Barrel (Repair)	48-C745203	X			
SIGN STRUCTURES					
Sign Struct (Rep/Repl)	75-SSSTRUC	X	X		
Sign Attach (Rep/Repl)	74-SSATTAC	X	X		
Sign Str Surface Spot	86-SSSURVS	X	X		
Lighting Sys (Rep/Repl)	73-SSLIGHT	X	X		
Sign Access (Rep/Repl)	87-SSACCES	X	X		
Struct Connection (Repl)	78-SSCONNT	X	X		
Foundation (Rep/Repl)	72-SSFOUND	X	X		
RETAINING WALLS					
Retaining Wall (Rep/Repl)	77-RTWALLR	X		X	
Facing (Rep/Repl)	83-RTFACNG	X		X	
Regrading	88-RTGRADE	X		X	
Drainage (Rep/Repl)	85-RTDRAIN	X		X	
Tie Back Connections (Rep/Repl)	84-RTTIEBK	X		X	
APPLY PROTECTIVE COATING					
Deck/Parapets/Sidewalk	80-A743401	X		X	X
Substructure	5-B743401	X		X	X
CONSTRUCT TEMPORARY					
Support Bent	59-A745401	X			
Pipes	81-B745401	X			
Bridge	76-C745401	X			
CONSTRUCT NEW					
Bridge	90-A742501	X			
Culvert	91-B742501	X			
COMBUSTIBLE MATERIAL REVIEW					
On-Site Review Required by PennDOT	96-Combust	X	X	X	X
RECOVERABLE BRIDGE DAMAGE					
Recoverable Bridge Damage	99-RECDAMG	X	X	X	X

When IM01, Scope is "Flex Action" for a Tunnel, the following actions are available to choose from:

Identifier (IM03)/ Description of Activity	Unit	Category*	Identifier (IM03)/ Description of Activity	Unit	Category*
CIVIL			MECHANICAL		
101 - Wearing Surface (Repair)	EA	Tunnel	122 - Ventilation System/Fans (Repair/Replace)	EA	Tunnel
102 - Tunnel Lighting System (Repair)	EA	Tunnel	123 - Drainage/Pumping Systems (Repair/Replace)	EA	Tunnel
TRAFFIC			FIRE, LIFE SAFETY & SECURITY SYSTEMS		
103 - Lane Signal (Repair/Replace)	EA	Tunnel	125 - CO2 Monitoring System (Repair/Replace)	EA	Tunnel
104 - Traffic Sign (Repair/Replace)	EA	Tunnel	126 - Fire Protection System (Repair/Replace)	EA	Tunnel
105 - Overheight Truck Warning System (Rep/Repl)	EA	Tunnel	127 - Emergency Communication System (Rep/Repl)	EA	Tunnel
LIGHTING SYSTEM			PROTECTIVE SYSTEMS		
106 - Tunnel Lighting System (Repair)	EA	Tunnel	129 - Fire Protective Coating (Repair/Replace)	EA	Tunnel
ELECTRICAL SYSTEM			130 - Concrete Corrosion Protective Coating (Rep/Repl)		
107 - Switchgear (Repair/Replace)	EA	Tunnel			
108 - Motor Control Center (Repair/Replace)	EA	Tunnel			
109 - Transformer (Repair/Replace)	EA	Tunnel			
110 - Transfer Switch (Repair/Replace)	EA	Tunnel			
111 - Panelboard (Repair/Replace)	EA	Tunnel			
112 - UPS Unit (Repair/Replace)	EA	Tunnel			
STRUCTURAL					
113 - Liner (Repair)	EA	Tunnel			
114 - Tunnel Roof/Ceiling Girders (Repair)	EA	Tunnel			
115 - Cross-Passageway (Repair)	EA	Tunnel			
116 - Interior Walls (Repair)	EA	Tunnel			
117 - Tunnel Portal (Repair)	EA	Tunnel			
118 - Invert Slab/Slab-On-Grade (Repair)	EA	Tunnel			
119 - Invert Girders (Repair)	EA	Tunnel			
120 - Tunnel Joint (Repair/Replace)	EA	Tunnel			
121 - Other Structural Maintenance	EA	Tunnel			

* Bridge = Bridge Maintenance
Tunnel = Tunnel Maintenance

Cleaning = Bridge Cleaning
Other = Other Structural Actions

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IM04 Est Quantity - Estimated Quantity

Other > Proposed Maintenance > Proposed Maintenance Detail; Form M

Description:

This item is used to record the estimated quantity of the bridge maintenance activity.

Procedure:

Enter the estimated quantity of the maintenance activity. The unit of measure will depend on the activity selected in Item IM02, Element or Item IM03, Action.

Coding:

Estimated quantity in whole numbers. Use standard rounding convention (0.5 and higher, round up; <0.5, round down) with a minimum estimated quantity value of "1."

IM05 Priority

Other > Proposed Maintenance > Proposed Maintenance Detail; Form M

Description:

This item is used to establish the urgency at which a selected action shall take place. The priority for an identified remedial action may evolve into a more urgent priority if the action is not completed as scheduled.

Procedure:

When a bridge inspector identifies Flexaction work candidates, each IM03 Action must be assigned a Priority code. Select the code from the dropdown list for the Flexaction work candidate. This item is a required field for all Flexactions.

The priority for the Action identified may evolve into a more urgent priority if repairs are not completed.

Coding:

		Short Definition	Action Timeframe
0	CRITICAL	Immediate response required	(within 7 days)
1	HIGH PRIORITY	As soon as work can be scheduled	(within 6 months)
2	PRIORITY	Review work plan and re-prioritize schedule.	(routine inspection interval)
3	SCHEDULE	Add to scheduled work.	(Add to schedule)
4	PROGRAM	Add to programmed work	(when funds are available)
5	ROUTINE	As per existing maintenance schedule.	(within the next work cycle)

Notes:

- 1) The District Bridge Engineer (and owner for non-PennDOT bridges) must be advised of conditions that warrant a Priority code 0 or 1 Flexaction work candidate, and must accept this coding before Item 1A07, Inspection Status, is changed to Approved. See Publication 238 Sections 2.13 and 2.14 for specific guidance and required actions for Priority Codes 0 and 1.
- 2) The action timeframe for a Priority 2 repair is the same as the routine inspection interval for the bridge (e.g., a bridge with a 48-month routine inspection interval will have a 4-year action timeframe but a bridge with a 24-month routine inspection interval will have a 2-year action timeframe).
- 3) All Flexactions must be recorded and input into BMS2 regardless of assigned Priority code.
- 4) If priority changes occur for a maintenance action that has not been sent to SAP, the previous priority(ies) along with original supporting information must be documented in the notes field.

Priority Code Definitions:

Bridge inspectors and reviewers must use sound judgment when determining the Priority of Flexaction repairs / maintenance activities. To support this effort, Priority code rating definitions and application examples are provided below. **The examples listed are organized by general location at the bridge site and are provided for guidance only. They should not be considered all inclusive, or comprehensive.**

Priority Code 0 - CRITICAL

If not addressed immediately, such deficiencies could directly or indirectly cause partial or total structure collapse resulting from component instability and/or localized element failure; or result in loss of vehicle operator control; or failure to contain errant vehicles on the bridge deck. Emergency Flexaction work (e.g. repair, replacement, posting/closing) is necessary to immediately mitigate the structural safety deficiencies with the required timeframe.

Examples for Priority Code 0 - CRITICAL

Selected condition examples for Flexaction work Priority code - 0 are provided below.

Bridge Signing Examples

1. **Deficient Legal Signing:** Includes missing, damaged, improperly located, or visually obstructed load posting or vertical clearance signs (includes relevant advance warning signs).

Applicable Flexactions include:

APPROACH ROADWAY: 70-RDLDSGN - Load Limit Signs (Replace)
51-RDCLSGN - Clearance Signs Replace, and
24-RDBRUSH - Cut Brush to Clear Signs

Deck Examples

2. **Unacceptable NHS Route Bridge Railing:** Bridge parapet, median barrier or structure-mounted guiderail on NHS routes with structural components damaged or deteriorated to a point that the parapet/railing is in serious condition and may not contain and/or redirect an errant vehicle traveling at the posted speed limit. Use Priority code 1 for Non NHS Routes.

Applicable Flexactions include:

RAILING: 7-RLGBRPR - Bridge/Parapet (Rep/Repl)
17-RLGSTRM - Struct Mount (Rep/Repl)
58-RLGMEDB - Median Barrier (Rep/Repl)

3. **Unacceptable Pedestrian Railing:** Missing or detached pedestrian rail that would allow an individual to fall off of the structure.

Applicable Flexactions include:

RAILING: 18-RLGPEDN - Pedestrian (Rep/Repl)

4. **Hazardous Sidewalk Conditions:** Applicable to structural components of the sidewalk/sidewalk supports and the walking surface such that damage/deterioration presents a hazard to pedestrians due to load carrying capacity on the structure and not along approaches. Approach sidewalk defects should be addressed using approach roadway maintenance items. (Note that a minor height difference between the approach and bridge sidewalk should not dictate a Priority 0 code.)

Applicable Flexactions include:

DECK: 39-E744303 - Concrete Sidewalk (Repair)

5. **Severely Deteriorated Expansion Joints:** Applicable to mechanical expansion devices when loose, damaged or deteriorated steel expansion joint armor or joint components present a hazard to vehicles.

Applicable Flexactions include:

DECK JOINTS: 33-B744102 - Compression Seal (Rep/Rehab)
53-C744102 - Modular Dam (Rep/Rehab)
20-D744102 - Steel Dams (Rep/Rehab)
9-E744102 - Other Types (Rep/Rehab)

6. **Traffic Obstructions:** Applies to guiderail connections to bridge rail, concrete barrier rebar, or metallic railing that has come detached and is in close proximity to traffic with the potential for impact.

Applicable Flexactions include:

APPROACH ROADWAY: 27-RDGDERL - Guiderail (Connect to Bridge)
RAILING: 7-RLGBRPR - Bridge/Parapet (Rep/Repl)

7. **Hazardous Deck Conditions:** Applicable to deficiencies within the traffic lanes or within 2 feet outside of travel lanes that pose a safety hazard to the traveling public, including:

- a. Broken scupper grates where sufficient separation exists between bars to trap bicycle tires or cause loss of control
- b. Spalls in concrete decks extending below the top mat of reinforcement
- c. Holes in corrugated steel flooring for bituminous-filled pan deck

Applicable Flexactions include:

DECK: 35-B744301 - Timber Deck (Rep/Repl)
6-D744303 - Concrete Deck (Repair)
37-C744302 - Open Steel Grid (Rep/Repl)
DECK DRAIN: 52-DRNGRAT - Scupper Grate (Replace)
Note: Applies to bridges used for bicycle traffic in addition to vehicular traffic.

Superstructure Examples

8. **Severe Impact Damage:** Vehicular collision damage that compromises the structural capacity of a primary member, including:
- a. Damage to steel beams where beam flanges have fractures, large gouges or where significant sweep, twisting or kinking of beams has been introduced by the collision impact.
 - b. Damage to timber beams where deep gouges or section loss have removed over 25% of the cross-section, and/or full length horizontal cracking is present.
 - c. Damage to P/S and CIP concrete beams where severed P/S tendons or reinforcing steel results in transverse flexure cracking and negative beam camber, and/or capacity of the damaged beam is less than sufficient to keep the bridge open.
 - d. Damage to truss compression members such that loss of cross sectional area or damaged reinforcing steel results in the onset of buckling or severe flexural cracking that now threatens the safety of the bridge.

This applies to bridges that have been recently hit by over-height vehicles, and also existing impact damage.

Applicable Flexactions include:

TIMBER:	62-A744601 - Stringer (Rep/Repl)
STEEL:	25-A744602 - Stringer (Rep/Repl)
	50-B744602 - Floorbeam (Rep/Repl)
	49-C744602 - Girder (Repair)
REINF. CONC. /	
PRESTRESSED CONC.:	42-A744603 - Stringer (Rep/Repl)
TRUSS:	36-A744701 - Members (Strengthen/Rep/Repl)
	82-B744701 - Portal (Modify)

9. **Fracture Critical Members (FCM):**

- a. **Impact Damage:** Impact damage that results in gouging or tearing of FCM components in tension. Since gouging/tearing are considered locations of stress risers and crack initiation points in a tension member, unexpected fracture could result.
- b. **Direct Stress Cracks:** Direct stress cracks are those in the base metal or weld materials that are perpendicular to the tensile stress carried by the member. Use Priority code 1 if supported by a structural evaluation. FCM examples include, but are not limited to:
 - Truss members in direct tension or reversible tension/compression including welded or riveted members, eyebars and loop rods
 - Tension zones of gusset plates connecting FCMs
 - Tension component or tension zone of a girder, cross girder, steel pier cap or floorbeam
- c. **Severe Corrosion:** Holes due to corrosion in FCM girder flanges, webs or in truss members.
- d. **Cracks Parallel to Stress in FCMs:** Initial cracking found in the tension zone of FCMs that is oriented parallel to the primary stress carried by the member. This type of cracking may be the result of out-of-plane distortion, bi-axial restraint or poor weld details, and could suddenly change direction under service conditions without mitigation, and become more serious.

Applicable Flexactions include:

STEEL:	50-B744602 - Floorbeam (Rep/Repl)
	49-C744602 - Girder (Repair)
TRUSS:	36-A744701 - Members (Strengthen/Rep/Repl)

10. **Deteriorated Pin-Hanger Assemblies in FCMs:** Severe deterioration to any components of the pin and hanger system or severe accumulation of debris or rust packing. Failure of pin hanger to expand or contract. Applies to pin-hanger assemblies without a redundant catcher system Retro-Fit.

Applicable Flexactions include:

STEEL:	49-C744602 - Girder (Rep/Repl)
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11. **Non-FCM Steel Fractures:** A steel member with a completely separated tension member component (I.E. the tension flange of a beam) due to fatigue cracking or vehicular impact.

Applicable Flexactions include:

STEEL:	25-A744602 - Stringer (Rep/Repl)
	50-B744602 - Floorbeam (Rep/Repl)
	49-C744602 - Girder (Repair)
TRUSS:	36-A744701 - Members (Strengthen/Rep/Repl)

12. **Severe Web Section Loss:** Severe web corrosion of adjacent beam ends on a steel multi-beam bridge or stringers on a Girder-Floorbeam-Stringer (GFS) or Truss-Floorbeam-Stringer (TFS) bridge or on individual GFS girders or floorbeams; that substantially reduces shear capacity or demonstrates the onset of web crippling (NOTE: the onset of web crippling is not required to make the priority a "0").

Applicable Flexactions include:

STEEL:	25-A744602 - Stringer (Rep/Repl)
	50-B744602 - Floorbeam (Rep/Repl)
	49-C744602 - Girder (Repair)

13. **Horizontal Web Cracks:** Web cracks on primary members due to out-of-plane bending and/or secondary stresses that substantially reduce shear capacity to levels less than sufficient to keep the bridge open.

Applicable Flexactions include:

STEEL:	25-A744602 - Stringer (Rep/Repl)
	50-B744602 - Floorbeam (Rep/Repl)
	49-C744602 - Girder (Repair)

14. **Cracked Cover Plate Welds:** One or more transverse cracks in the bottom flange at the end of a partial length welded cover plate of steel multi-girder, or steel floorbeam.

Applicable Flexactions include:

STEEL:	25-A744602 - Stringer (Rep/Repl)
	50-B744602 - Floorbeam (Rep/Repl)
	49-C744602 - Girder (Repair)

15. **Severe Deterioration of Timber Primary Members:** Timber members with multiple open cracks in high stress regions, or have locations where crushing as occurred or exhibit significant rot such that superstructure settlement has occurred or can be anticipated to occur.

Applicable Flexactions include:

TIMBER:	62-A744601 - Stringer (Rep/Repl)
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16. **Deteriorated Non-Composite Adjacent Box Beam:** Serious deterioration where Item 1A04, Superstructure Condition Rating, is ≤ 3 due to strand loss, loss of camber or torsional cracking. For bridges already load posted due to this condition, use Priority 1.

Applicable Flexactions include:

REINF CONC. /	
PRESTRESSED CONC.:	42-A744603 - Stringer (Rep/Repl)

17. **Falling Concrete:** Delaminated or partially detached overhead concrete that may fall on vehicles and/or pedestrians under the bridge.

Applicable Flexactions include:

REINF CONC. /	
PRESTRESSED CONC.:	42-A744603 - Stringer (Rep/Repl)

Culvert Examples

18. **Unacceptable Out-of-plane Distortion of Corrugated Metal Arch Culverts:** Distortion (e.g. bulging or flattening) of arch barrel greater than 3 inches out-of-plane caused by corrosion due to age and/or conditions.

Applicable Flexactions include:

CULVERT: 48-C745203 - Barrel (Repair)

19. **Severe Corrosion and Section Loss of Corrugated Metal Arch Culverts:** Severe corrosion, typically at longitudinal seams, resulting in visible holes/perforations in approximately 50% or more of the corrugations along a 4 foot length or in the loss or ineffectiveness of approximately 50% or more of the bolts/nuts along a 4 foot length of a longitudinal seam. In conjunction with corrosion, out of plane distortion or bulging may be present.

Applicable Flexactions include:

CULVERT: 48-C745203 - Barrel (Repair)

Substructure Examples

20. **Severe Impact Damage:** Vehicular collision damage that compromises the structural capacity of a pier shaft, column, cap wall or sign structure pedestal.

Applicable Flexactions include:

ABUTMENT - WING -
PIER, etc.: 32-D744802 - Piers (Repair)

21. **Severe FCM Support Damage:** Severe structural cracking in a concrete pier column or cap supporting a fracture critical bridge or fracture critical component of a fracture critical bridge. (Ex. Fracture critical cross girder or pier cap supported by a concrete column/shaft).

- "Severe structural cracking" should be considered as cracks $\geq 1/2$ " wide and that would be developed due to loss of bond or yielding of the reinforcement and possibly identified by movement between pieces of the cracked element segmented by the crack.

Applicable Flexactions include:

ABUTMENT - WING -
PIER, etc.: 32-D744802 - Piers (Repair)

22. **Severe Bearing Seat Damage:** Severely deteriorated or undermined beam seat (loss of bearing area $\geq 40\%$).

Applicable Flexactions include:

BEARINGS: 45-D744503 - Pedestal/Seat (Reconstruct)

23. **Critical Rocker Bearing Tilt:** Applicable where there are one or two lines of expansion rocker bearings on a single pier and one or more bearings in a line exhibit excessive tilt, bearing on the outer one-quarter width of the rocker.

Applicable Flexactions include:

BEARINGS: 68-C744502 - Expansion (Reset)
44-A744501 - Steel (Rep/Rehab)
61-B744501 - Steel (Replace)

Note: Include IM15 Note such as - "Bearings exceed acceptable limit of tilt," or "Bearing on outer one-quarter width of rocker base."

24. **Severe timber pile, cribbing, and cap deterioration:** Applicable to timber substructures that have loss of bearing capacity or soil retention through crushing, rot, or infestation.

Applicable Flexactions include:

TIMBER: 60-B744601 - Other members (Rep/Repl)

Note: Include comment in notes (item IM15a) indicating the type/cause, location, and extent of the damage.

Sign Structure Examples

25. **Severe Impact Damage:** Vehicular collision damage to the connections and members for structure mounted signs, and cantilever or truss posts, chords or diagonals for overhead sign structures such that the cross section area results on the onset of buckling or flexural cracking that threatens the safety of the sign structure.

Applicable Flexactions include:

SIGN STRUCTURES: 75-SSSTRUC - Sign Struct (Rep/Repl)
74-SSATTAC - Sign Attach (Rep/Repl)
78-SSCONNT - Struct Connection (Repl)

26. **Severe Sign Structure Member or Attachment Section Loss:** Severe section loss of sign structure member, splice plates, or attachment such that the ability of the structure to carry the load is compromised to the point of imminent failure. Missing fasteners at between the sign and the mount. Missing nuts or bolt attachment failures at the column base plate connection to the foundation. Loose or missing nuts and bolts on cantilevers are considered a critical deficiency.

Applicable Flexactions include:

SIGN STRUCTURES: 75-SSSTRUC - Sign Struct (Rep/Repl)
74-SSATTAC - Sign Attach (Rep/Repl)
78-SSCONNT - Struct Connection (Repl)

27. **Loss of Sign Structure Foundation Support:** Out of plumb condition for cantilever sign columns or twisting of trusses indicating differential settlement or bearing failure of sign structure foundations.

Applicable Flexactions include:

SIGN STRUCTURES: 72-SSFOUND - Foundation (Rep/Repl)

28. **Sign Structure Lighting System:** Serious deterioration of the light supports at the connections. Broken light supports exist and lights may be hanging only by electrical connections. Integrity of any associated junction box has been compromised.

Applicable Flexactions include:

SIGN STRUCTURES: 73-SSLIGHT - Lighting Sys (Rep/Repl)

Retaining Wall Examples

29. **Excessive Wall Rotation:** Applicable where wall rotation has permitted slope failure and subsidence adjacent to nearby structures or roadways resulting in foundation damage or differential deflection between any sections or the entire wall out-of-plumb exceeds 4 inches.

Applicable Flexactions include:

RETAINING WALLS: 77-RTWALLR - Retaining Wall (Rep/Repl)
ABUTMENT - WING -
PIER, etc.: 28-B744802 - Abutments (Repair)
15-C744802 - Wing (Rep/Repl)

Waterway Examples

30. **Serious Scour:** Scour with significant undermining of substructure foundations as defined in the Scour Definition Diagram for Scour Hole (Item IN05):

- Where undermining affects over 20% of the length or area of the footing with an unknown foundation type (P or X) or
- Over 20% of the area under the footing for footings without piles.
- Where depth of undermining has affected the stability of piles for footings on piles (a pile stability analysis may be required).

Applicable Flexactions include:

SCOUR CONTROL:	11-C745301 - Scour Hole (Backfill)
	13-B745301 - Rock Protection
ABUTMENT - WING - PIER, etc.:	22-E744803 - Footing (Underpin)

31. **Excessive Debris or Sediment Buildup:** For bridges with SCBI \leq 3 or those with unknown foundations where debris or sediment buildup is impacting the hydraulic opening defined by the ordinary high water elevation such that:

- > 20% of any individual span opening is blocked, or
- > 20% of the total hydraulic opening for multiple span bridges is blocked, or
- Serious local scour has occurred adjacent to a substructure unit because of debris or sediment build-up.

Applicable Flexactions include:

SCOUR CONTROL:	3-ECREMGV - Vegetation/Debris (Remove)
	12-ECREMDP - Deposition (Remove)

Priority Code 1 - HIGH PRIORITY

This code is applicable to a serious structural deficiency to a primary bridge element that could lead to load restrictions, lane and/or bridge closures or, if not corrected, may jeopardize public safety. Flexactions to address these deficiencies should be performed independently of the normal work schedule to complete the Flexaction within the required timeframe.

The inspection frequency may need to be increased to ensure that conditions will not deteriorate to a Priority code 0 level and that safety of the traveling public will not be compromised. The bridge load rating should be re-evaluated to assure consideration of the cited deficiency.

Examples for Priority Code 1 - HIGH PRIORITY

Selected condition examples for Flexaction work Priority code - 1 are provided below.

Deck Examples

1. **Serious Deck Deterioration:** Applicable to holes/spalls in the top surface of concrete decks that expose deck reinforcement with a minimum area of approximately 1 SF and located within the traffic lanes or within 2 feet outside of travel lanes.

Applicable Flexactions include:

DECK:	35-B744301 - Timber Deck (Rep/Repl)
	6-D744303 - Concrete Deck (Repair)
	37-C744302 - Open Steel Grid (Rep/Repl)

2. **Repair/Reseal Leaking Deck Joints:** Applicable to leaking deck joints on the following where the joint is no longer preventing water from wetting the superstructure elements and beam seats or the leakage has resulted in section loss or spalling to the superstructure or substructure:

- Bridges on the Interstate or NHS
- Non-NHS bridges critical to commercial or emergency network
- When the bridge is longer than 500 Ft

Applicable Flexactions include:

DECK JOINTS: 2-A743301 - Reseal
 4-A744101 - Repair/Reseal

3. **Unacceptable Non-NHS Route Bridge Railing:** Bridge parapet or structure-mounted guiderail on non-NHS routes with primary structural components damaged or deteriorated to a point that the parapet/railing is in serious condition and may not contain and/or redirect an errant vehicle traveling at the posted speed.

Applicable Flexactions include:

RAILING: 7-RLGBRPR - Bridge/Parapet (Rep/Repl)
 17-RLGSTRM - Struct Mount (Rep/Repl)
 58-RLGMEDB - Median Barrier (Rep/Repl)

4. **Hazardous Sidewalk Conditions:** Applicable to the sidewalk surface such that damage/deterioration presents a significant tripping hazard to pedestrians.

Applicable Flexactions include:

DECK: 39-E744303 - Concrete Sidewalk (Repair)

Superstructure Examples

5. **Advanced Section Loss in FCMs:** Corrosion conditions that indicate structural capacity and remaining fatigue life may be compromised and the structure may no longer support legal traffic loads.

Applicable Flexactions include:

STEEL: 50-B744602 - Floorbeam (Rep/Repl)
 49-C744602 - Girder (Repair)
 TRUSS: 36-A744701 - Members (Strengthen/Rep/Repl)

6. **Deteriorated Pin-Hanger Assemblies w/Redundancy:** Severe deterioration to any components of the pin and hanger system or to the installed retro-fit. Severe deterioration to any components of the pin and hanger system or severe accumulation of debris or rust packing. Failure of pin hanger to expand or contract. Improper alignment or severe deterioration of the catcher-beam system. Applicable only to:

- Pin-Hanger Assemblies with Retro-Fit on Non-redundant Girders (Retro-Fit involves installation of redundant catcher system), or
- Pin-Hanger Assemblies without Retro-Fit on Redundant Girders

Applicable Flexactions include:

STEEL: 49-C744602 - Girder (Repair)

7. Non FCM

- a. **Direct Stress Cracks in Primary Steel Members (Not FCMs):** Active cracks in steel tension members or tension member components that reduce structural capacity and remaining fatigue life such that the capacity of the damaged member is just sufficient to keep the structure functional for traffic.
- b. **Cracks Parallel to Stress in Primary Steel Members (Not-FCMs):** Initial cracking found in the tension zone of steel members that is oriented parallel to the primary stress carried by the member. This type of cracking may be the result of out-of-plane distortion, bi-axial restraint or poor welding, and without mitigation, could suddenly change direction under service conditions and become more serious.
- c. **Serious Steel Member Corrosion:** Multi-beam bridge with serious deterioration, web/flange with heavy section losses, no web crippling or crushing evident/no excessive deflection evident.

Applicable Flexactions include:

STEEL:	25-A744602 - Stringer (Rep/Repl)
	50-B744602 - Floorbeam (Rep/Repl)
	49-C744602 - Girder (Repair)

8. Non -Composite Adjacent Box Beam:

- a. **Cracking:** Deterioration where the superstructure condition rating (Item 1A04) is ≤ 3 due to diagonal cracks in a fascia beam located under an open parapet joint.
 - Where the open joint parapet has been replaced using continuous reinforcement through the parapet joints, Priority 2 can be assigned.
- b. **Loss of Prestress:** Serious deterioration where Item 1A04, Superstructure Condition Rating, is ≤ 3 due to strand loss or loss of camber and the bridge is already posted due to this condition.

Applicable Flexactions include:

REINF CONC./	
PRESTRESSED CONC.:	42-A744603 - Stringer (Rep/Repl)

9. **Open Structural Cracks in P/S Concrete Beams:** Transverse flexure cracks across the bottom flanges at mid-span, and diagonal shear cracks at beam supports.

Applicable Flexactions include:

REINF CONC./	
PRESTRESSED CONC.:	42-A744603 - Stringer (Rep/Repl)

Culvert Examples10. **Visible Out-of-plane Distortion of Corrugated Metal Arch Culverts:** Visible distortion (e.g., bulging or flattening) of arch barrel greater than 2 inches and less than or equal to 3 inches out of plane caused by corrosion due to age and/or conditions.

Applicable Flexactions include:

CULVERT:	48-C745203 - Barrel (Repair)
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11. **Serious Corrosion and Section Loss of Flexible Metal Culverts:** Serious corrosion, typically at longitudinal seams, resulting some minor holes/perforations along a 4 foot length or in the loss or ineffectiveness of consecutive bolts/nuts along a 1 foot or greater length of a longitudinal seam.

Applicable Flexactions include:

CULVERT:	48-C745203 - Barrel (Repair)
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Substructure Examples

12. **Significant FCM Support Damage:** Significant structural cracking in a concrete pier column or cap supporting a fracture critical bridge or fracture critical component of a fracture critical bridge. (Ex. Fracture critical cross girder or pier cap supported by a concrete column/shaft).

- “Significant structural cracking” should be considered as cracks $\geq 1/4$ ” and $< 1/2$ ” wide and that would be developed due to loss of bond or yielding of the reinforcement. Movement between pieces of the cracked element segmented by the crack may not be apparent at this time. Concrete shear interlock must be present based on the crack width and orientation.

Applicable Flexactions include:

ABUTMENT - WING -
PIER, etc.: 32-D744802 - Piers (Repair)

13. **Serious Bearing Seat Damage:** Serious deterioration or undermined beam seat (loss of bearing area less than 40%). “Repair bearing seats” should be considered a priority code ‘1’ only if the deficiencies are severe enough such that they are controlling Item 1A02, Substructure Condition Rating, and results in $1A02 \leq 3$.

Applicable Flexactions include:

BEARINGS: 45-D744503 - Pedestal/Seat (Reconstruct)

14. **Non-Functioning Steel Bearing:** Repair/replace frozen (non-functioning) steel bearings (i.e. rollers, pot bearings, spherical, etc.) where the expansion length under consideration is 150 feet or greater feet. Heavy accumulation of pack rust, corrosion and/or debris is limiting or preventing the bearing from operating as intended during superstructure expansion and contraction. Substructure distress or movement is not evident.

Applicable Flexactions include:

BEARINGS: 44-A744501 - Steel (Rep/Rehab)
61-B744501 - Steel (Replace)

15. **Abnormal Rocker Bearing Tilt:** Applicable where there is at least one line of expansion rocker bearings and one or more bearings in a line exhibit tilt in the opposite direction indicated by ambient air temperature; that is rocker bearings in the contracted position (tilted toward the fixed bearing) in warm weather (ambient temperature above 68° F) or in the expanded position (tilted away from the fixed bearing) in cold weather (ambient temperature below 68° F). Also applicable when movement analysis indicates a potential for the bearings to reach or exceed its maximum movement capacity, outer one-quarter limit for rockers on piers and the outer one-tenth limit for rockers on abutments.

The following should have been assigned for this condition:

Applicable Flexactions include:

BEARINGS: 68-C744502 - Expansion (Reset)

Note: Include IM15a Note such as – “Rocker bearings are in an expanded position in cold weather, in a contracted position in warm weather or parallel tilt for two lines of expansion rocker bearings at adjacent spans on a common support.”

16. **Rocker Bearing Debris Restriction:** Rocker bearings located on piers with heavy accumulations of pack rust, corrosion, and/or debris under the rocker could potentially limit or prevent the bearing from operating as it was intended during structure expansion and contraction.

Applicable Flexactions include:

CLEAN/FLUSH: 8-C743102 - Bearing/Bearing Seat

Note: Include IM15a Note such as – “Pack rust, corrosion, and/or debris under the rocker could potentially be limiting or preventing the bearing from operating as it was intended during structure expansion and contraction. In addition to “flushing”, it may be necessary to remove pack rust by mechanical means.”

Sign Structure Examples

17. **Direct Stress Cracks in Primary Steel Members (Not FCMs):** Active cracks in steel tension members or tension member components that reduce structural capacity and remaining fatigue life such that the capacity of the damaged member is just sufficient to keep the structure functional for traffic.

Applicable Flexactions include:

SIGN STRUCTURES: 75-SSSTRUC - Sign Struct (Rep/Repl)

18. **Serious Steel Member Corrosion:** Sign structure with serious deterioration, web/flange with heavy section losses, no web crippling or crushing evident/no excessive deflection evident.

Applicable Flexactions include:

SIGN STRUCTURES: 75-SSSTRUC - Sign Struct (Rep/Repl)
74-SSATTAC - Sign Attach (Rep/Repl)
78-SSCONNT - Struct Connection (Repl)

19. **Sign Structure Lighting System:** Serious deterioration of the light supports at the connections. Broken light supports may exist such that they may fall onto traffic.

Applicable Flexactions include:

SIGN STRUCTURES: 73-SSLIGHT - Lighting Sys (Rep/Repl)

20. **Loss of foundation Support for Sign Structures:** Applicable to truss and cantilever sign structures having severe spalling with exposed reinforcement and section loss in the pedestals. Towers may have rotated or twisted by the column connection anchorage is still intact.

Applicable Flexactions include:

SIGN STRUCTURES: 72-SSFOUND - Foundation (Rep/Repl)

Retaining Wall Examples

21. **Damage to Retaining Walls:** Applicable to retaining walls with out-of-plumb rotation between 1 ½ and 4 inches over the exposed height of the wall or spalling with complete loss of concrete through the wall or open cracks >1/2 inch indicating substantial differential settlement has occurred. Spill through of retained soil may be present.

Applicable Flexactions include:

RETAINING WALLS: 77-RTWALLR - Retaining Wall (Rep/Repl)

Waterway Examples

22. **Damaging Scour:** Advanced scour with very slight undermining of substructure foundation as defined in the Scour Definition Diagram for Scour Hole (Item IN05):

- Where undermining affects $\leq 20\%$ of the length of the footing with an unknown foundation type (P or X) or
- Where undermining affects $\leq 20\%$ of the length of the footing when the foundation area is unknown or drawings are not available or
- Where undermining affects $\leq 20\%$ of the area under the footing for footings without piles.

Applicable Flexactions include:

- SCOUR CONTROL: 11-C745301 - Scour Hole (Backfill)
 13-B745301 - Rock Protection
- ABUTMENT - WING -
 PIER, etc.: 22-E744803 - Footing (Underpin)

23. **Serious Debris or Sediment Build-up:** Where debris or sediment buildup is impacting the hydraulic opening defined by the ordinary high water elevation such that:

- a. For bridges with SCBI ≤ 3 or those with unknown foundations:
 - 10% to 20% of any individual span opening is blocked, or
 - 10% to 20% of the total hydraulic opening is blocked, or
 - Advanced local scour has occurred adjacent to a substructure unit because of the debris or sediment build-up.
- b. For bridges with SCBI ≥ 4 or those with known foundations:
 - > 30% of any individual span opening is blocked, or
 - > 30% of the total hydraulic opening is blocked, or
 - Serious local scour has occurred adjacent to a substructure unit.

Applicable Flexactions include:

- SCOUR CONTROL: 3-ECREMGV - Vegetation/Debris (Remove)
 12-ECREMDP - Deposition (Remove)

Note: The use of Priority 0 or 1 is not expected to be justifiable for the following items:

Component	Maintenance Activity
Deck	80-A743401- PROT.CTG.TO SUPERSTR
Deck	10-BITWRGS- RPR/RPL. BIT. W.S.
Drainage	31-B744401- INSTAL.DK.DRAIN
Drainage	14-C744402- RPR/RPL.DWNSPTG
Painting	57-A743201- SPOT PAINT SUPERSTR.
Painting	16-B743201- SPOT PAINT SUBSTR.
Painting	65-C743201- PAINT SUPERSTRUCTURE
Painting	79-D743201- PAINT SUBSTRUCTURE
Sign Structures	86-SSSURVS - Sign Str Surface Spot
Scour Control	55-D745302- RPR/CONSTRM.DEFLECT.
Substructure	5-B743401- PROT.CTG.TO SUBSTR.
Substructure	19-F744804- REPOINT MASONRY
Retaining Wall	88-RTGRADE - Regrading

Priority Code 2 - PRIORITY

This code is applicable to an advanced deficiency on a primary bridge element or appurtenance that may eventually lead to further deterioration, load restrictions, lane and/or bridge closures, or may compromise public safety if not corrected.

Examples for Priority Code 2 - PRIORITY

Selected condition examples for Flexaction work Priority code - 2 are provided below.

Approach Roadway Examples

1. **Missing/Incorrect/Damaged Approach Safety Features:** Applicable for all bridges and culverts and dependent on Item IA02, Adequacy of Traffic Safety Features 2 thru 4 condition appraisal, combined with Item 4A10, Deck Geometry Rating.
 - See the Priority code summary table for **RDGDERL Maintenance Priority (IM02)** after the examples for Priority Code 5.
2. **Missing / Incorrect Horizontal Clearance Markers (Z-Boards):** Applicable to certain one-lane bridges on two-lane roadways with deficient approach safety features.
 - See the Priority code summary table for **Maintenance Priority Coding for Missing Horizontal Clearance Signs (Z-boards/ Hazard Clear Signs)** after the examples for Priority Code 5.

Deck/ Superstructure/ Sign Structure/ Substructure/ Retaining Wall Examples

3. **Advanced Deterioration on Primary Members:** Applicable to various material defects that are sufficiently advanced to warrant re-analysis of the bridge, sign structure member, or culvert for loss of capacity, and subsequent Load Posting. Specific conditions would include:
 - Steel primary members with significant section loss, especially beam webs at supports and bottom flanges at mid-span, and metal culvert shapes at the flow line.

Applicable Flexactions include:

STEEL:	25-A744602 - Stringer (Rep/Repl)
	50-B744602 - Floorbeam (Rep/Repl)
	49-C744602 - Girder (Repair)
SIGN STRUCTURES:	75-SSSTRUC - Sign Struct (Rep/Repl)
	74-SSATTAC - Sign Attach (Rep/Repl)
	78-SSCONNT - Struct Connection (Repl)
TRUSS:	36-A744701 - Members (Strengthen/Rep/Repl)

- CIP Concrete bridge members, walls, and rigid culvert shapes with exposed steel tension or shear reinforcement that has advanced section loss in high stress regions.
- CIP Concrete members, walls, and rigid culverts with open flexure cracks or shear cracks.
- P/S Concrete members with hairline flexure cracks and partial depth shear cracks.
- P/S Concrete members with exposed or severed P/S tendons and/or corroded shear reinforcement.
- CIP Concrete pier column with significantly reduced cross-section due to deteriorated concrete.

Applicable Flexactions include:

REINF CONC./	
PRESTRESSED CONC.:	42-A744603 - Stringer (Rep/Repl)

ABUTMENT - WING - PIER, etc.:	38-A744801 - Backwall (Rep/Repl) 28-B744802 - Abutments (Repair) 15-C744802 - Wing (Rep/Repl) 32-D744802 - Piers (Repair)
CULVERT:	48-C745301 - Barrel (Repair)
RETAINING WALLS:	77-RTWALLR - Retaining Wall (Rep/Repl)

- Timber bridge primary members, with open horizontal shear or flexure cracking, that has advanced section loss due to rot or insect damage in high stress regions.

Applicable Flexactions include:

TIMBER:	62-A744601 - Stringer (Rep/Repl)
---------	----------------------------------

Culvert Examples

4. **Visible Out-of-plane Distortion of Corrugated Metal Arch Culverts:** Visible distortion (e.g., bulging or flattening) of arch barrel less than or equal to 2 inches out of plane caused by corrosion due to age and/or conditions.

Applicable Flexactions include:

CULVERT:	48-C745301 - Barrel (Repair)
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5. **Advanced Corrosion and Section Loss of Corrugated Metal Arch Culverts:** Evidence of advanced section loss along a 4-foot length, typically at longitudinal seams or the flow line. Estimate the expected remaining useful life of the culvert based upon actual corrosion observed. See example below. Record this value in the IM15a Notes field.

Applicable Flexactions include:

CULVERT:	48-C745301 - Barrel (Repair)
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Example of Estimating Remaining Culvert Life

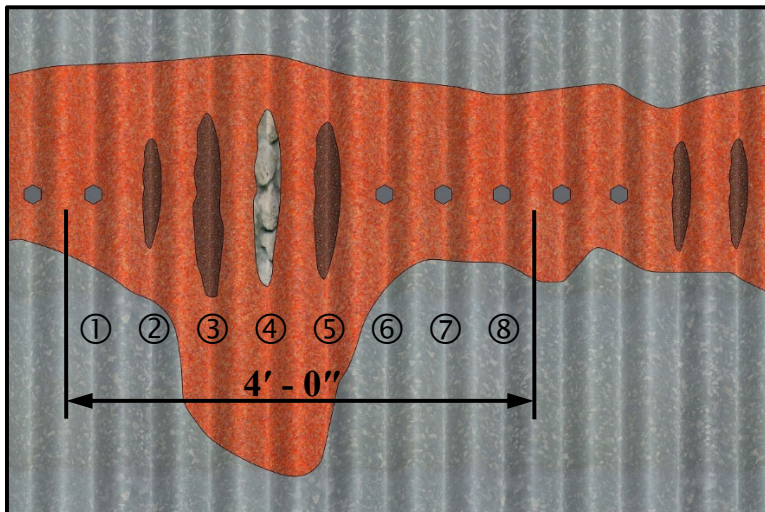
initial thickness, $t_0 = 0.250$ in.

acceptable avg. section loss, $S.L_{allow} = 50\% = 0.125$ in.

theoretical rate of loss, $R_{loss (theor)} = 0.002$ in/yr

age at inspection, $n = 40$ yrs.

avg. remaining thickness, $t_n = 0.160$ in. (measured over most severe 4' length)



In worst 4 ft. section (see figure above):

- corrugations with 100% loss: 1
- with 50% loss: 3
- with 25% loss: 4

avg. section loss, S.L. = $[1(100\%) + 3(50\%) + 4(25\%)] / 8 = 43.8\%$

avg. section loss, $t_{\text{loss}} = t_0 \times \text{S.L.} = (0.250)(43.8\%) = 0.109 \text{ in.}$

avg. rate of loss, $R_{\text{loss (actual)}} = t_{\text{loss}} / n = 0.109 / 40 = 0.0036 \text{ in/yr}$

acceptable remaining loss, $\text{S.L.}_{\text{allow (future)}} = \text{S.L.}_{\text{allow}} - t_{\text{loss}} = 0.125 - 0.109 = 0.016 \text{ in.}$

rate of future section loss, $R_{\text{loss (future)}} = \max [R_{\text{loss (theor)}}, R_{\text{loss (actual)}}] = 0.003 \text{ in/yr}$

Estimated Remaining Useful Life = $\text{S.L.}_{\text{allow (future)}} / R_{\text{loss (future)}} = 0.016 / 0.003 = 5.3 \text{ yrs.}$

Enter into IM15a: Remaining Useful Life 5.3 years as of [month, year].

Waterway Examples

6. **Advanced Scour at Substructure Unit(s):** Scour ranging from top of footing to slight undermining.

Applicable Flexactions include:

For bridges with SCBI (Item 4A08) of 4 and below:

SCOUR CONTROL: 13-B745301 - Rock Protection

7. **Advanced Debris Build-up:**

- For bridges with SCBI ≤ 3 or those with unknown foundations – Advanced Debris buildup blockage is:
 - 5% to 10% of the area below the ordinary high water elevation of any span, or
 - 5% to 10% or more of the span length, or
 - any debris buildup which may cause local scour to occur.
- For bridges with SCBI ≥ 4 or those with known foundations – Advanced Debris buildup blockage is:
 - 15% to 30% of the area below the ordinary high water elevation of any span, or
 - 15% to 30% or more of the span length, or
 - any debris buildup which is causing local scour to occur.

Applicable Flexactions include:

SCOUR CONTROL: 3-ECREMG - Vegetation/Debris (Remove)

Advanced Secondary Element Damage

8. **Repair/Reseal Leaking Deck Joints:** Applicable to bridges not on the Interstate or NHS when the joint system is no longer preventing water from wetting the superstructure elements and beam seats resulting in section loss or spalling to the superstructure or substructure.

Applicable Flexactions include:

DECK JOINTS: 2-A743301 - Reseal

4-A744101 - Repair/Reseal

9. **Defective Deck and Roadway Drainage Devices:** Applicable to bridges not on the Interstate or NHS when the defective system has resulted in accelerated deterioration of a primary structural member, such as spalling of concrete pier shaft due to a broken downspout, or corrosion of a steel fascia beam due to a leaking deck inlet box.

Applicable Flexactions include:

- DECK DRAIN: 31-B744401 - Drain/Scupper (Install)
14-C744402 - Down spouting (Rep/Repl)

10. **Deteriorated Access Components in Sign Structures:** Section loss or broken welds on grating, walkways, or railings attached to sign structures used for access.

Applicable Flexactions include:

- SIGN STRUCTURES: 87-SSACCES - Sign Access (Rep/Repl)

Priority Code 3 - SCHEDULE

This code is applicable to a minor but documentation-worthy deficiency to a primary bridge element or appurtenance that may become more serious if left unaddressed for an extended period of time. Flexaction work candidates to address these deficiencies should be incorporated into the normal work schedule as resources permit. The cited deficiencies are not sufficient to warrant re-evaluation of the bridge load rating.

Examples for Priority Code 3 - SCHEDULE

Selected condition examples for Flexaction work Priority code – 3 are provided below.

1. **Missing/Incorrect/Damaged Approach Safety Features:** Applicable for all bridges and culverts and dependent on Item IA02, Adequacy of Traffic Safety Features 2 thru 4 condition appraisal, combined with Item 4A10, Deck Geometry Rating.
 - o See the Priority code summary table for **RDGDERL Maintenance Priority (IM02)** on Page 3-340
2. **Missing / Incorrect Horizontal Clearance Markers (Z-Boards):** Applicable to certain one-lane bridges on two-lane roadways with deficient approach safety features.
 - o See the Priority code summary table for **Maintenance Priority Coding for Missing Horizontal Clearance Signs (Z-boards/ Hazard Clear Signs)** on Page 3-341.
3. **Minor Deterioration of Primary Structural Members:** Applicable to all bridge, retaining walls, sign structures, and culvert components, candidate deficiencies include concrete spalls on bridge retaining wall or culvert elements when reinforcing steel is exposed, structural cracks suitable for injection, loose structural fasteners, including retaining wall tie back connections, and timber members with signs of insect damage, and active fungus rot and deterioration ongoing on the surface. Sign Structure corrosion is readily apparent with minor (<10%) section loss in the primary truss or cantilever members, connections, and attachments.

Applicable Flexactions include:

- TIMBER: 62-A744601 - Stringer (Rep/Repl)
60-B744601 - Other members (Rep/Repl)
(Applicable to Substructure)
- STEEL: 25-A744602 - Stringer (Rep/Repl)
50-B744602 - Floorbeam (Rep/Repl)
49-C744602 - Girder (Repair)
- REINF. CONC. /
PRESTRESSED CONC.: 42-A744603 - Stringer (Rep/Repl)
- TRUSS: 36-A744701 - Members (Strengthen/Rep/Repl)
- SIGN STRUCTURES: 75-SSSTRUC - Sign Struct (Rep/Repl)
74-SSATTAC - Sign Attach (Rep/Repl)
78-SSCONNT - Struct Connection (Repl)
- DECK: 35-B744301 - Timber Deck (Rep/Repl)

	6-D744303 - Concrete Deck (Repair)
	37-C744302 - Open Steel Grid (Rep/Repl)
ABUTMENT - WING - PIER, etc.:	38-A744801 - Backwall (Rep/Repl)
	28-B744802 - Abutments (Repair)
	15-C744802 - Wing (Rep/Repl)
	32-D744802 - Piers (Repair)
CULVERT:	48-C745203 - Barrel (Repair)
RETAINING WALLS:	77-RTWALLR - Retaining Wall (Rep/Repl)
	84-RTTIEBK - Tie Back Connections (Rep/Repl)

- 4. **Advanced Deterioration of Secondary Members:** Repair or replacement of secondary members of bridges and sign structures that can no longer resist the secondary forces they were designed to carry.

Applicable Flexactions include:

TIMBER:	60-B744601 - Other members (Rep/Repl)
STEEL:	54-D744602 - Diaph/Lat. Bracing (Rep/Repl)
	(Note: applicable to straight girder bridges)
REINF. CONC. / PRESTRESSED CONC.:	26-C744603 - Other members (Rep/Repl)

- 5. **Repointing Masonry:** Applicable to stone masonry structures with cracked, loose, and missing mortar, or vegetation growing between the stones.

Applicable Flexactions include:

ABUTMENT - WING - PIER, etc.:	19-F744804 - Masonry (Repoint)
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- 6. **Scour hole backfill:** Applicable to minor channel scour conditions in the channel. Minor scour conditions include simple streambed depressions in the channel profile up- and downstream and underneath the bridge. Footings have not been exposed.

Applicable Flexactions include:

SCOUR CONTROL:	11-C745301 - Scour hole (Backfill)
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- 7. **Placement of Rock Protection:** Applicable to restoration of minor embankment damage and protection of substructure units demonstrating vulnerability to scour.

Applicable Flexactions include:

SCOUR CONTROL:	13-B745301 - Rock Protection
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- 8. **Frozen Steel Bearings:** Repair/replace frozen (non-functioning) steel bearings (i.e. rollers, pot bearings, spherical, etc.) where the expansion length under consideration is less than 150 feet. Heavy accumulation of pack rust, corrosion and/or debris is limiting or preventing the bearing from operating as intended during superstructure expansion and contraction.

Applicable Flexactions include:

BEARINGS:	44-A744501 - Steel (Rep/Rehab)
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- 9. **Wall Facing repair:** Applicable when the deteriorated area including concrete spalls when reinforcing steel is exposed, structural cracks suitable for injection and loose structural fasteners.

Applicable Flexactions include:

RETAINING WALLS:	83-RTFACNG - Facing (Rep/Repl)
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10. **Brush Clearing:** Applicable when the brush, trees, or other forms of vegetation limit the ability of the under bridge inspection crane or other inspection access equipment to access all portions of the bridge.

Applicable Flexactions include:

CLEAN/FLUSH: 92-BRSHCLR – Brush Clearing

Priority Code 4 - PROGRAM

This code is applicable to a noteworthy problem on a primary or secondary bridge element, or appurtenance that may lead to a documentable defect if left unaddressed for an extended period of time. Flexaction work candidates to address these problems should be planned as additional work to the normal work schedule and completed as resources become available. The cited problems are not sufficient to warrant re-evaluation of the bridge load rating.

Examples for Priority Code 4 - PROGRAM

Selected condition examples for Flexaction work Priority code – 4 are provided on the following pages.

1. **Minor Deterioration of Structure Elements:** Applicable to all bridge, sign structure, retaining wall, and culvert components, candidate deficiencies include concrete spalls and light cracking that require minor patching and sealing to prevent further deterioration.

Applicable Flexactions include:

DECK:	6-D744303 - Concrete Deck (Repair)
ABUTMENT - WING -	
PIER, etc.:	28-B744802 - Abutments (Repair)
	15-C744802 - Wing (Rep/Repl)
	32-D744802 - Piers (Repair)
REINF. CONC. /	
PRESTRESSED CONC.:	42-A744603 - Stringer (Rep/Repl)
	69-B744603 - Diaphragm (Rep/Repl)
	26-C744603 - Other Members (Rep/Repl)

2. **Wearing Surface Replacement:** Patching or complete replacement.

Applicable Flexactions include:

DECK: 10-BITWRGS - Bitum. Deck W. Surf (Rep/Repl)

3. **Approach Roadway Repairs:** Includes patching approach slab spalls, sealing cracks, restoring shoulders and restoring embankments.

Applicable Flexactions include:

APPROACH ROADWAY: 40-RDPAVMT - Pavement (Patch/Raise)
 41-RDRLFJT - Pavement Relief Jt. (Rep/Repl)
 46-RDSDLDR - Shoulders (Repair/Reconstr)
 47-RDDRAIN - Drainage-Off Bridge (Improve)

4. **Abutment Slopewall Deterioration:** Applicable to bridges having slopewalls either monolithic reinforced concrete, stone or concrete block exhibiting heaving, open cracks, differential settlement, separation between sections that will allow erosion or scour to occur in front of the abutment. This also applies to evidence of loss of slope for abutments due to erosion or scour that do not presently have a slope wall.

Applicable Flexactions include:

ABUTMENT - WING -
 PIER, etc.: 43-B745101 - Abut. Slopewall (Rep/Repl)
 43-B745102 - Abut. Slopewall (Construct New)

5. **Lubricate Corroded Bearings:** Lubrication of plates and or hinges of otherwise “normal” bearings as necessary to maintain proper bearing function.

Applicable Flexactions include:

BEARINGS: 66-A743501 - Lubricate

6. **Steel Painting:** Spot, zone or full painting of structural steel.

Applicable Flexactions include:

PAINTING: 57-A743201 - Superstructure-Spot

16-B743201 - Substructure-Spot

65-C743201 - Superstructure-Full

79-D743201 - Substructure-Full

SIGN STRUCTURE: 86-SSSURVS - Sign Str Surface Spot

7. **Protective Coatings:** Apply protective coatings to bridge decks, parapets, and sidewalks, and other portions of the bridge superstructure.

Applicable Flexactions include:

APPLY PROTECTIVE

COATING: 80-A743401 - Deck/Parapets/Sidewalk

5-B743401 - Substructure

8. **Missing / Incorrect / Damaged Approach Safety Features:** Applicable for all bridges and culverts and dependent on Item IA02, Adequacy of Traffic Safety Features 2 thru 4 condition appraisal, combined with Item 4A10, Deck Geometry Rating.

- o See the Priority code summary table for **RDGDERL Maintenance Priority (IM02)** on Page 3-340

9. **Missing / Incorrect Horizontal Clearance Markers (Z-Boards):** Applicable to certain one-lane bridges on two-lane roadways with deficient approach safety features.

- o See the Priority code summary table for **Maintenance Priority Coding for Missing Horizontal Clearance Signs (Z-boards/ Hazard Clear Signs)** on Page 3-341.

10. **Retaining Wall repair:** Applicable when the deteriorated area including concrete spalls and light cracking that require minor patching and sealing to prevent further deterioration and wall drainage is inhibited. Applicable when erosion has changed the grading along the front or rear faces of the wall.

Applicable Flexactions include:

RETAINING WALLS: 83-RTFACNG - Facing Rep/Repl

85-RTDRAIN - Drainage (Rep/Repl)

88-RTGRADE - Regrading

Priority Code 5 - ROUTINE

This code is applicable to a non-structural condition associated with the accumulation of roadway dirt and debris on or in bridge members, not affecting public safety, that occurs over time and with normal use of the structure. Such conditions if left unaddressed for an extended period of time may lead to deterioration of structural members.

Flexaction work candidates to address these conditions are comprised of cleaning operations and considered part of a routine maintenance cycle, typically pre-scheduled for implementation on an annual basis. When a bridge is identified as a work candidate through routine inspection activities, maintenance

forces should review pre-scheduled work to assure the candidate bridge is included, and make adjustments as necessary.

Examples for Priority Code 5 - ROUTINE

Selected condition examples for Flexaction work Priority code - 5 are provided below. These include cleaning bridge components such as deck, scupper/downspout, steel surfaces, and bearing areas.

- CLEAN/FLUSH:
- 23-A743101 - Deck
 - 1-B743101 - Scupper/Down spouting
 - 8-C743102 - Bearing/Bearing Seat
 - 34-D743102 - Steel Horizontal Surfaces

Additional Priority coding guidelines for selected items:

The priority of approach guiderail work can be interpreted as a function of Deck Geometry Rating (4A10) and Adequacy of Traffic Safety Features 2 thru 4 (IA02). Use the following table as a guide for the priority of RDGDERL.

Deck Geometry Rating (4A10)	RDGDERL Maintenance Priority (IM02)	
	<u>Lowest</u> Condition Ratings for Traffic Safety Features 2 thru 4 (IA02)	
	IF IA02 = 2	IF IA02 = 3
6 - 9	3	4
4 and 5	2	3
≤ 3	2	2

The following items should also be considered in the coding of this maintenance needs priority and may raise or lower values given in the table above.

- Vehicle speed in the vicinity of the bridge
- Geometry of the roadway (including sight distance)
- Damage to existing components

For these bridges, do not code the priority of RDGDERL above a 3 without approval of the District Traffic Engineer.

**Maintenance Priority Coding for Missing Horizontal
Geometry Advisory Signs (Z-boards/ Hazard Clear Signs/Narrow Bridge/, etc.)**

Case Description	Lowest Condition Ratings for Traffic Safety Features 2 thru 4 (IA02)	RDCLSGN Maintenance Priority (IM05)
(a). One lane bridges on two way roads (Item 5C27 - Bridge Roadway Width < 16 ft)	IA02 < 6	2
	IA02 ≥ 6	3
(b). Narrow two lane bridges (Item 5C27 - Bridge Roadway Width < 24 ft)	IA02 < 6	3
	IA02 ≥ 6	4
(c). All other bridges where Z-boards were installed, but are now missing or damaged.	N/A	3

Note:

1. This table applies to signs related to geometric constraints of the bridge and can include signs such as one-lane bridge, hazard clearance, narrow bridge, etc.
2. Where collision damage is evident and/or accident history indicates the bridge is a potential accident site, the above Priority codings may be reduced.

IM05b Date Maint Pri Changed - Date Maintenance Priority Changed


Other > Proposed Maintenance > Proposed Maintenance Detail

Description:

This item is used to record the date the priority (IM05) of a maintenance item was changed.

Procedure:

This date will be automatically entered by the system for all proposed maintenance items when the priority level changes. In addition to the date, the new priority level will also be recorded.

A history of the priority change can be viewed by clicking the  button to the right of Item IM05. When clicked, a pop-up box will open and display the history.

Coding:

Date in MM/DD/YYYY and time in HH:MM:SS format.

- MM 2 digit month
- DD 2 digit day of month
- YYYY 4 digit year
- HH 2 digit hour
- MM 2 digit minute
- SS 2 digit second

IM06 Init Recm'd Date – Initial Recommended Date

Other > Proposed Maintenance > Proposed Maintenance Detail; Form M

Description:

This item is used to record the date the work candidate was initially recommended.

Procedure:

Enter the date on which the work candidate was initially recommended. This date should not be changed. The date the maintenance priority was changed is tracked through IM05b.

Coding:

Date in MM/DD/YYYY format:

MM	2 digit month
DD	2 digit day of month
YYYY	4 digit year

IM07 Status of Work Candidate

Other > Proposed Maintenance > Proposed Maintenance Detail; Form M

Description:

This item is used to indicate status of the work candidate.

Procedure:

Select the appropriate status for the work candidate from the dropdown list.

Coding:

- 0 Work not planned or scheduled – Default status as maintenance activities are entered into BMS2
- 1 Work planned/Dept – Work is planned for Department forces. When work is to be sent to SAP/PM, Districts will change the status from 0 to 1.
- 2 Work planned/Contr – Work is planned for Contractor forces.
- 3 Work sent to SAP – Automatically set once the "Submit to SAP" button has been selected for a maintenance item.
- 4 Review Required – Work has been completed by Department Forces and needs to be reviewed. When the Maintenance crews have completed and closed out the item, the status will be changed to "4" by the District, depending on the work activity.
- 5 Completed/Dept – Work has been completed by Department forces. For selected work activities, the work has reviewed by the District Bridge Unit and has been completed satisfactorily.
- 6 Completed/Contr – Work has been completed by Contractor forces. To be entered by the Districts when a contractor has completed a maintenance item.
- 7 Superseded – Work items have been eliminated as a result of Rehabilitation or Replacement - To be entered by the Districts when a maintenance crew/contractor has eliminated a work item by replacing or rehab the unit.
- D Deferred – Bridge Maintenance has been deferred because other remedial action will be taken

IM08 Target Year

Other > Proposed Maintenance > Proposed Maintenance Detail; Form M

Description:

This item is used to record the tentative implementation or actual program year the of the maintenance activity.

Procedure:

Enter the fiscal or calendar year when that includes the implementation of the individual maintenance activity.

Coding:

YYYY 4 digit year

IM09 Location

Other > Proposed Maintenance > Proposed Maintenance Detail; Form M

Description:

This item is used to record the location where the bridge maintenance activity is required.

Procedure:

Enter the location of the maintenance activity.

Coding:

The location field is only capable of storing 25 characters. Users shall abbreviate whenever possible with the following terms:

N	Near	UP	Upstream
F	Far	DN	Downstream
LNR	Near Left or Right	UN	Under
LFR	Far Left or Right	OUT	Outlet
1, 2, 3	Span, Pier or Sign #	IN	Inlet

IM10 Est Cost - Estimated Cost

Other > Proposed Maintenance > Proposed Maintenance Detail

Description:

This item is used to record the estimated cost of the work candidate.

Procedure:

Enter the estimated cost of the work candidate in dollars. For a status of "6 - Completed/Contr", enter the actual cost of the work. For a status of "7 - Superseded", leave blank.

***IM11 Work Assign**

Other > Proposed Maintenance > Proposed Maintenance Detail; Form M

Description:

This item is used to record if the maintenance activity is a candidate for completion by Department forces or by contract.

Procedure:

Select the code that indicates how the work could be completed.

Coding:

0 Agency
1 Contractor

IM12 Drawing Indicator

Other > Proposed Maintenance > Proposed Maintenance Detail

Description:

This item is used to indicate whether or not drawings are required and available to perform the maintenance activity.

Procedure:

If the drawings are required to perform the maintenance item, check the indicator box. Otherwise, the box should remain unchecked.

Coding:

Unchecked The maintenance item does not require design/repair drawings.
Checked The maintenance item does require design/repair drawings.

IM13 Permit Indicator

Other > Proposed Maintenance > Proposed Maintenance Detail

Description:


This item is used to indicate whether or not permits are required to perform the maintenance activity.

Procedure:

If permit(s) are required to perform the maintenance item, check the indicator box. Otherwise, the box should remain unchecked.

Coding:

Unchecked The maintenance item does not require permit(s).
Checked The maintenance item does require design permit(s).

IM14a Comp Date - Date Completed 

Other > Proposed Maintenance > Proposed Maintenance Detail; Form M

Description:

This item is used to record the date the work candidate was completed.

Procedure:

Enter the date on which the work candidate was completed. This item will be automatically entered for completed work coming from Plant Maintenance/SAP (status = 5). For a status of "6 - Completed/Contr" or "7 - Superseded", enter the date the work was completed.

Coding:

Date in MM/DD/YYYY format:

MM	2 digit month
DD	2 digit day of month
YYYY	4 digit year

IM14b POA Date - Plan of Action Date 

Other > Proposed Maintenance > Proposed Maintenance Detail

Description:

This item is used to record the date the Plan of Action for a priority 0 or 1 maintenance activity was developed.

Procedure:

Enter the date on which development of the Plan of Action was developed. This is a required field for all Flexactions with a Priority 0 or 1.

Coding:

Date in MM/DD/YYYY format:

MM	2 digit month
DD	2 digit day of month
YYYY	4 digit year

IM14c Mitigation Date 

Other > Proposed Maintenance > Proposed Maintenance Detail

Description:

This item is used to record the date a priority 0 maintenance activity was mitigated.

Procedure:

Enter the date on which the priority 0 maintenance activity was mitigated. Mitigation of a priority 0 maintenance activity indicates that a temporary measure(s) has been installed to address the immediate safety concern until a permanent repair will be in place. Examples of mitigation measures are temporary shoring, lane restrictions, load posting, bridge closure, etc.

If mitigation measures are implemented, item IM05 Priority is to be revised to a priority 1, and the bridge owner is to record the mitigation procedures in Item IM15a Notes. In addition, the bridge owner has 6

months to repair the priority 1 activity. If the new coded priority 1 maintenance activity is not to be completed until contract work, item IM07 Status is to be coded "D-deferred".

Coding:

Date in MM/DD/YYYY format:

MM	2 digit month
DD	2 digit day of month
YYYY	4 digit year

IM15a Notes

Other > Proposed Maintenance > Proposed Maintenance Detail; Form M

Description:

This item is used to record any notes on the work recommended. This field is also required for Plan of Actions (POA) for maintenance activities that have a priority 0 or 1.

Procedure:

Inspector's and, if warranted, District notes entered to amplify upon, better describe, or more thoroughly document the maintenance actions and address priorities. All notes will be numbered in the following format: #N (where N = number of the note). This format will allow parsing of the large note field into individual notes

Inspectors: Provide amplifying information as required to assist in the definition of the required level of effort and location(s) for the maintenance requirement.

Districts: The following notes are required and must be entered into BMS2 for all bridges with high priority bridge structure maintenance items.

Required Notes – Note #1: Note 1 is reserved for tracking priority code changes and providing justification for those changes. State what the previous code was and why it was revised.

Examples

- #1 Priority code was a 0 and was changed because of...
- #1 Not Applicable" (Used if no changes were made to the priority codes).

General Notes – Note #2, #3, etc.: Note #4 and higher are for general notes which provide detail for the maintenance action and status of key milestones. Provide as much detail as possible. Notes should be updated as new information is obtained.

Example 1: On December 12, 2007 a bridge inspector identified significant loss in the bearing seat under the bearing for beam 1 at the NAB and assigned a priority 1.

#1 NA

#2 Temporary barriers have been placed on 12/13/2007 to prevent traffic travelling in the westbound lane.

#3 Notification was sent to SAP on 12/15/2007

#4 County Maintenance crews will begin repairs on 12/21/2007.

Example 2: During an underwater bridge inspection on May 7, 2007 bridge inspectors identified new, significant undermining under the far abutment. A phone call was made to the District bridge unit.

#1 NA

#2 Bridge was closed on May 7th and barriers put in place.

#3 District contacted Contractor XYZ to mobilize for repairs.

#4 Contractor arrived on sight on May 8th and began coffer dam construction. Expected to complete dam on May 9th.

#5 Expected to complete repairs on May 11th.

Note: After repairs have been made, the District must record the actual completion date in Item IM14 and status in Item IM07.

Example 3: During a routine bridge inspection on July 3, 2007 bridge inspectors noted that a far advance bridge posting sign was missing. A phone call was made to the District bridge unit.

#1 NA

#2 Bridge Unit called Traffic Unit requesting a new sign on July 3.

#3 Traffic Unit put in an order for load posting sign on July 3.

#4 Sign expected to arrive on July 10.

Note: After repairs have been made, the District must record the actual completion date in Item IM14 and status in Item IM07.

IM15b Deferred Notes

Other > Proposed Maintenance > Proposed Maintenance Detail

Description:

This item is used to record any notes on the deferred bridge maintenance work. This field is required for Plan of Actions (POA) for maintenance activities that have a priority 1 or higher and item IM07 status is set to D-Deferred.

Procedure:

This field is reserved for tracking items where action was deferred. State what the previous code was and why it is revised. **Priority 0 work actions cannot, by definition, be deferred.** Priority 1 work actions may be deferred provided they meet the following conditions: corrective action (rehabilitation or replacement) is scheduled; the condition of the bridge will not degrade to a point where a Priority 0 need would result prior to the scheduled action. Notes should be updated as new information is obtained. A deferred priority 1 should be addressed within two years of the date recommended. Exceptions to this rule should be submitted to the Bridge Inspection Section Chief by the District Bridge Engineer for approval.

All notes will be numbered in the following format: #N (where N = number of the note). This format will allow parsing of the large note field into individual notes. Notes should be updated as new information is obtained.

Coding:

Information that should be entered include:

- Work that was deferred due to a scheduled project – identify project number and scope.
- Bridge monitoring – record dates of monitoring
- Bridge Restrictions such as lane restrictions, posting, and closures. Include dates that restrictions were implemented.

Example: During a routine bridge inspection on October 20, 2007 bridge inspectors noted that rocker bearings are exceeding the allowable angle of tilt and assigned a priority 0.

- #1 Bridge inspectors immediately called District Bridge Engineer
- #2 County maintenance crew was notified on October 20, 2007 of problem.
- #3 County placed temporary wood blocking at rocker bearings on October 21.
- #4 Superstructure is scheduled for replacement in May 2008.
- #5 Continue to monitor every 6 months until replacement.

Note: Permanent repairs were not made. Item IM14 Completed date should not be entered, Item IM07 status should be set to "D-Deferred", and Item IM05 priority should be set to 1.

IM15c Authorized Bridge Approval

Other > Proposed Maintenance > Proposed Maintenance Detail

Description:

This item is used to record the name of the responsible person in the District Bridge Unit to ensure the work activity gets completed. For Priority Codes 0 and 1, this will be the same person who approves the POA, typically the District Bridge Engineer.

Procedure:

Enter the name from the District Bridge unit who will oversee that the activity gets completed.

IM15d Authorized Maintenance Approval

Other > Proposed Maintenance > Proposed Maintenance Detail

Description:

This item is used to record the name of the responsible person in the County Maintenance Unit or the District Construction Unit to ensure the work activity gets completed. For Priority Codes 0 and 1, this will be the same person who approves the POA in the County, typically the County Maintenance Manager.

Procedure:

Enter the name from the County who will oversee that the activity gets completed. If work is contracted out, enter the name from the District Construction unit who will oversee the work.

IM15e (Not Used – Reserved for Future Use)

IM16 SAP Closed Date

Other > Completed Maintenance

Description:

This item is used to record the date that the work item was closed out by Department maintenance forces.

Procedure:

This field is completed based on information obtained from SAP/Plant Maintenance.

IM17 SAP WO Num - SAP Work Order Number

Other > Completed Maintenance

Description:

This item is used to record the SAP Work Order Number assigned to the maintenance item. Procedure: This field is completed based on information obtained from SAP/Plant Maintenance.

IM18 Act Quan - Actual Quantity

Other > Completed Maintenance

Description:

This item is used to record the actual quantity of the work completed.

Procedure:

This item will be automatically entered for completed work coming from Plant Maintenance/SAP (e.g. status = 3 or 4).

IM19 Act Cost - Actual Cost

Other > Completed Maintenance

Description:

This item is used to record the actual cost of the work completed.

Procedure:

This item will be automatically entered for completed work coming from Plant Maintenance/SAP (e.g. status = 3 or 4).

IM20 MPMS #

Other > Completed Maintenance

Description:

This item is used to record the MPMS # associated with the work.

Procedure:

In order for an MPMS # to appear, a project must be created in the Project Planning module and the work item must be linked to the specific MPMS project. See BMS2 Basics for creating projects in BMS2.

IS Inspection - Signs / Lights

The Sign/High-Mast Light Inspection screen allows users to view and/or edit information related to sign structure and high-mast light inspections. This screen is applicable only when the user selects a sign or high-mast light structure.

IS01 Sign/Light Inspection Type - Inspection Type for Sign/Light Structure

Inspection > Signs and Lights; Form S

Description:

This item is used to record the type of inspection that was performed on the sign structure or high mast light pole.

Procedure:

Select the code from the dropdown list that describes the type of inspection that was performed on the structure.

Coding:

IS01: Code the inspection type according to the table on the next page.

NOTE:

- 7A03: Code "S" for sign structures and "L" for hi-mast lighting poles.
- 7A06: For IS01 Inspection types A, B, C, or D, check 7A06 NBI block.
For IS01 Inspection type E, leave 7A06 NBI "unchecked".

IS01 Coding	Inspection Type for Sign and High Mast Light Pole Structures
A	<p>Initial - All of structure's inventory data is verified along with performance of "hands-on in-depth" inspection of entire structure (over all lanes for signs) as described below.</p> <ul style="list-style-type: none"> ▪ Date of this inspection will begin cycle for future inspections
B	<p>In-depth - A close visual and hands-on examination of each component, member, fastener, and weld on sign and light structures. Existing inventory data is to be updated. Each lane of traffic beneath structure is closed in turn to permit direct access from bucket truck.</p> <ul style="list-style-type: none"> ▪ Meets NBI-like inspection requirements. Can be used to measure adherence to schedule.
C	<p>In-depth (Alternate Lanes Closed) - A close visual and hands-on examination of column bases, end supports, and selected portions of horizontal members. Areas of horizontal members to have close hands-on inspection are selected to provide overall safety while minimizing traffic disruption. Those portions of structure over lanes not being closed are to be viewed using binoculars from adjacent closed lanes locations. Existing inventory data is to be updated.</p> <ul style="list-style-type: none"> ▪ Meets NBI-like inspection requirements. Can be used to measure adherence to schedule. ▪ Not applicable for high-mast lighting.
D	<p>Routine - A close visual and hands-on examination of all portions of structure, including columns, portions of horizontal members, etc., which can be accessed <u>without traffic control</u>. Those portions which cannot be accessed safely from beyond the edge of pavement are viewed using binoculars. Existing inventory data is to be updated.</p> <ul style="list-style-type: none"> ▪ Meets NBI-like inspection requirements. Can be used to measure adherence to schedule.
E	<p>Special - Inspection performed to provide detailed assessment of special conditions when significant structural deficiencies, severe section loss, collision damage or corrosion are present. In most instances, special inspections are only performed on a specific portion of the structure.</p> <ul style="list-style-type: none"> ▪ Does not meet NBI-like inspection requirements. Do not use to measure adherence to schedule.

Coding Examples:

For sign/light inspection types as described in the table below use the appropriate coding:

Type of Inspection Performed	Coding for 7A03	7A06 NBI Check Box	Coding for IS01
Initial inspection.	S,L	<input checked="" type="checkbox"/>	A
In-Depth inspection.	S, L	<input checked="" type="checkbox"/>	B
Alternating lane in-depth inspection.	S	<input checked="" type="checkbox"/>	C
Routine inspection	S,L	<input checked="" type="checkbox"/>	D
Special inspection	S,L	<input type="checkbox"/>	E

Condition Rating Codes Used for Sign/Light Structure Rating Only

In order to promote uniformity between inspectors, these guidelines will be used to rate and code items IS02, IS03, IS04, IS05, IS06, IS07, IS08, IS09 and IS10.

Condition ratings are used to describe the existing in-place structure as compared to the as-built condition.

Condition codes are properly used when they provide an overall characterization of the general condition of the entire component being rated.

Do not rate condition based on localized or nominally occurring instances of deterioration or disrepair. Correct assignment of a condition code must, therefore, consider both the severity of the deterioration or disrepair and its extent throughout the component being rated.

The determination of which of the following ratings apply to each of the items will be based on an evaluation of all the relevant factors and information included in the detailed inspection reports. The rating chosen for each of these items will, in effect, be a composite of all of the relevant factors.

It should be recognized that this will require judgment, particularly for those items where the ratings seem not to apply. There are unique situations, but again, it is expected that some judgment will be used.

Rating Codes:

- N** **Not Applicable.**
- 8** **Good Condition** - No apparent problems.
- 6** **Satisfactory Condition** - Structural elements sound. Minor cracking, loose bolts, missing safety chains, broken lights.
- 4** **Poor Condition** - Moderate structural cracking, missing bolts, missing nuts, significant corrosion, minor collision damage.
- 2** **Critical** - Major structural defects, loose components that could fall on roadway. Loose or missing anchor bolts or nuts on cantilevers. Excessive weld cracking.

Note:

Codes of 1, 3, 5, 7 and 9 are acceptable, but not recommended.

IS02 Foundation - Column Base Condition Rating

Inspection > Signs and Lights; Form S

Description:

This item indicates the condition of the base of the column of the sign structure or high mast light poles.

Procedure:

Select the code from the dropdown list which indicates the condition of the column base assembly anchor. This includes the relevant condition of the base assembly, anchor bolts, the column foundation, and the attachments for a structure mounted sign.

Coding:

Refer to CONDITION RATING CODES listed on the first page of this section.

IS03 Guiderail - Guiderail Condition Rating

Inspection > Signs and Lights; Form S

Description:

This item indicates the condition of the guiderail in front of sign structure or high mast light poles.

Procedure:

Select the code from the dropdown list which indicates the condition of the guiderail, if applicable.

Coding:

Refer to CONDITION RATING CODES listed on the first page of this section.

IS04 Column - Column Condition Rating

Inspection > Signs and Lights; Form S

Description:

This item indicates the condition of the column(s) of the sign structure or high mast light poles.

Procedure:

Select the code from the dropdown list which indicates the condition of the column(s).

Coding:

Refer to CONDITION RATING CODES listed on the first page of this section.

IS05 Method of Access - Access Condition Rating

Inspection > Signs and Lights; Form S

Description:

This item indicates the condition of the means of access for inspection and maintenance.

Procedure:

Select the code from the dropdown list which indicates the condition of the access including supports. If no access exists on the structure, code "N".

Coding:

Refer to CONDITION RATING CODES listed on the first page of this section.

IS06 Sign - Sign Condition Rating (Sign Structure Only) 📌

Inspection > Signs and Lights; Form S

Description:

This item indicates the structure condition of the sign(s). Do not rate legibility and visibility of the sign. This item does not apply to high mast light pole structures.

Procedure:

Select the code from the dropdown list which indicates the structural condition of the sign(s) and connections, if applicable. Code "N" for high-mast light pole structures.

Inspectors shall pay close attention to the use of aluminum lock nuts which attach the sign panels to the sign structure or bridge. Certain grades of aluminum lock nuts have resulted in cracking and eventual splitting. In addition, the proprietary High-Lock nuts that used non-galvanized steel nuts acted as a sacrificial metal on the sign structure and corroded rapidly. The use of aluminum nuts and High-Lock nuts has been discontinued. Previous sign structure inspection reports should be reviewed where aluminum bolts have been replaced. Additional cracking of the original nuts and the condition of the replacement nuts should be thoroughly checked.

Coding:

Refer to CONDITION RATING CODES listed on the first page of this section.

IS07 Lights - Light Condition Rating 📌

Inspection > Signs and Lights; Form S

Description:

This item indicates the structural condition of the lights, if applicable.

Procedure:

Select the code from the dropdown list which indicates the structural condition of the lighting apparatus. If lights do not exist on the structure, code "N".

Coding:

Refer to CONDITION RATING CODES listed on the first page of this section.

IS08 Surface/Paint - Surface Condition Rating 📌

Inspection > Signs and Lights; Form S

Description:

This item indicates the condition of the surface of all structural members.

Procedure:

Select the code from the dropdown list which indicates the condition of the surface of all structural members. This includes columns, horizontal members, and cross members. If the structure is painted, then rate the condition of the paint.

Coding:

- 8, 7 **Good** – spot galvanizing and/or spot painting is required. Discoloration can be present due to early evidence of the breakdown of the galvanizing.
- 6, 5 **Fair** – program for galvanizing or painting. Discoloration is present indicating an intermediate stage of protection failure.
- 4 **Poor** – urgently in need of galvanizing or painting. Galvanizing failure is present and rust is beginning to form.
- 3, 2 **Critical** – structural repair may be required before applying protective coating. Loss of cross-section area has occurred.
- 0 **Intolerable** – beyond repair (painting or hot dip galvanizing is a waste of resources)

IS09 Horizontal Member/Frame - Horizontal Member Condition Rating (Sign Structures Only) 📌

Inspection > Signs and Lights; Form S

Description:

This item indicates the condition of the horizontal member. Code the framework for a structure mounted sign under this item.

Procedure:

Select the code from the dropdown list which indicates the condition of the horizontal member or the framework for a structure mounted sign. Code “N” for high mast light structures.

Coding:

Refer to CONDITION RATING CODES listed on the first page of this section.

IS10 Overall - Overall Condition Rating of the Sign/Light Structure 📌

Inspection > Signs and Lights; Form S

Description:

This item indicates the condition of the structure.

The overall rating of the structure should reflect the structural safety condition of the structure. Some less critical items may be rated “4” while the overall condition rating could be “6” or vice versa. For example, a poorly performing galvanizing surface is not sufficient to rate as “poor” the overall condition.

Procedure:

Select the code from the dropdown list which indicates the condition of the structure.

Coding:

Refer to CONDITION RATING CODES listed on the first page of this section.

IS11 Notes - Inspection Notes

Inspection > Signs and Lights; Form S

Description:

This item is used to record any narrative information that the inspector feels is necessary or may assist in the next inspection of the structure. Critical deficiencies that are identified from the inspection report should be noted here in a brief abbreviated format.

Procedure:

Record any narrative information that is necessary to identify inspection findings.

IS12 Next Inspection Type - Next Inspection Type for Sign/Light Structure 📌

Inspection > Signs and Lights

Description:

This item is used to record the next type of inspection recommended to be performed on the sign structure or high mast light pole.

Procedure:

Select the code from the dropdown list that describes the next type of inspection recommended to be performed on the sign structure.

Coding:

(Refer to descriptions under inspection type of sign structure, item IS01)

- A Initial Inventory
- B In-depth
- C In-depth (Alternate Lanes Closed)
- D Routine
- E Special

IS13 Next Inspection Freq - Frequency of Inspection of Sign/Light Structure 📌

Inspection > Signs and Lights

Description:

This item is used to record the frequency of the sign/light structure inspection in months. This data should reflect the same value as 7A09 NBI.

Procedure:

- Enter the value for 7A09 NBI for the frequency of sign /light structure inspection in months.
- For sign structures frequencies, refer to Pub 238 IP 2.11.3.
- For hi-mast lighting, frequency policy is to be determined.

Coding:

The inspection frequency, in months. Prefix with zeros where necessary.

IS14 Next Inspection Date - Complete Next Inspection By This Date

Inspection > Signs and Lights

Description:

This item is used to record the date by which the next inspection is to be completed. This data field should reflect the same value as 7A10.

Procedure:

Enter the date by which the next inspection is to be completed. This item may be calculated by the system by clicking on the "Calculate" button to the right of the field.

Coding:

Date by which the next inspection is to be completed in MM/DD/YYYY format:

MM 2 digit month
 DD 2 digit day of month
 YYYY 4 digit year

IS15 Sign Asset Tags – Tag Existence and Condition

Inspection > Signs and Lights; Form S

Description:

This item is used to record whether or not the sign structure displays asset tag(s) and the condition of the tag(s).

Procedure:

Select the code from the dropdown list that describes the presence and condition of asset tag(s) on the sign structure. Record any narrative information that is necessary to identify inspection findings in the IC01 comment type for Sign Asset Tags.

Coding:

Present – Good Condition	All required tags are present and properly installed on the sign structure per Pub. 15M (DM-4), Section 3.6.3. The entire tag is intact, the BRKEY is readable, and the entire tag adheres properly to the structure.
Present - Damaged	All required tags are present. However, part of the asset tag may be missing, the BRKEY is not readable, tag(s) are not properly installed per Pub. 15M, and/or the adhesive is failing to adhere the entire tag to the sign structure.
Missing	One or both (if applicable) of the asset tags are missing.
Not Applicable	Structure mounted signs (BMS2 coding 6A29 = 45) are not required to have asset tags.

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IW Inspection - Walls

The Wall Inspection screen allows users to view and/or edit information related to retaining wall and noise wall inspections. This screen is applicable only when the user selects a wall structure.

IW01 Primary Inspection Type - Inspection Type for Wall Structure

Inspection > Walls; Form W

Description:

This item is used to record the type of inspection that was performed on the wall structure.

Procedure:

Select the code from the dropdown list that describes the type of inspection that was performed on the wall structure.

Coding:

- IW01:** Code the inspection type according to the table below.
- 7A03:** Code "T"
- 7A06:** For Inspection types F, D, or R, check 7A06 NBI block because they are NBI-Like inspections. Leave 7A06 empty if coding P for this field.

Inspection Type (IW01)	Inspection Type for Wall Structure
F	<p>INITIAL (FIRST TIME) -1st time close visual and hands-on inspection of all wall components and includes the completion of a wall’s inventory data on BMS2 VW screen. See Pub 238 IP 2.15 for additional inspection requirements for retaining wall drainage, mechanically stabilized earth (MSE) walls, 3D surveys and other items.</p> <ul style="list-style-type: none"> ▪ Meets NBIS-like inspection requirements ▪ Date of this inspection will begin cycle for future inspections.
D	<p>IN-DEPTH - A close visual and hands-on examination of all components in the walls. Existing inventory data is to be updated. See Pub 238 IP 2.15 for additional inspection requirements for retaining wall drainage, mechanically stabilized earth (MSE) walls, 3D survey and other items. All items included on iForms Forms M, P and W must be completed.</p> <ul style="list-style-type: none"> ▪ Meets NBIS-like inspection requirements. Can be used to measure adherence to schedule.
R	<p>ROUTINE - A close visual and hands-on examination of walls without traffic control. <u>Those portions which cannot be accessed safely from beyond the edge of pavement are viewed using binoculars and/or a digital camera. Existing inventory data is to be updated. All items included on iForms Forms M, P and W must be completed.</u></p> <ul style="list-style-type: none"> ▪ Meets NBIS-like inspection requirements. Can be used to measure adherence to schedule.
P	<p>PROBLEM AREA -_A close visual and hands-on examination of walls to provide a detailed assessment when significant deficiencies, collision damage, or other problems are present or after an extreme weather (e.g. heavy prolonged rains or flooding) or seismic event may have occurred. All items included on iForms Forms M, P and W must be completed. In most cases, special inspections are performed on a specific portion or detail of a structure.</p> <ul style="list-style-type: none"> ▪ Does not meet NBIS-like inspection requirements. Do not use to measure adherence to schedule.

Coding Examples:

For wall inspection types as described in the table below use the appropriate coding:

Type of Inspection Performed	Coding for 7A03	7A06 NBI Check Box	Coding for IW01
Initial inspection	T	<input checked="" type="checkbox"/>	F
Routine inspection	T	<input checked="" type="checkbox"/>	R
In-Depth inspection	T	<input checked="" type="checkbox"/>	D
Special inspection	T	Empty	P

Condition Rating Codes Used for Retaining Wall Rating Only

In order to promote uniformity between inspectors, these guidelines will be used to rate and code items IW02, IW03, IW04, IW05, IW06, IW07, IW08, IW09, and IW10.

Condition ratings are used to describe the existing in-place structure as compared to the as-built condition.

Condition codes are properly used when they provide an overall characterization of the general condition of the entire component being rated.

Do not rate condition based on localized or nominally occurring instances of deterioration or disrepair. Correct assignment of a condition code must, therefore, consider both the severity of the deterioration or disrepair and the extent to which it is widespread throughout the component being rated.

The determination of which of the following ratings apply to each of the items will be based on an evaluation of all the relevant factors and information included in the detailed inspection reports. The rating chosen for each of these items will, in effect, be a composite of all of the relevant factors.

It should be recognized that this will require judgment, particularly for those items where the ratings seem not to apply. There are unique situations, but again, it is expected that some judgment will be used.

Rating Codes:

- N Not Applicable.**
- 8 Good Condition** - No apparent problems.
- 6 Satisfactory Condition** - Structural elements sound. Localized drainage problems, settlement, staining, washing of fines from backfill material.
- 4 Poor Condition** - Localized buckling, deteriorated face panels, joint problems, major settlement, ice damage.
- 2 Critical** - Major structural defects, components have moved to point of possible collapse.

Note:

Codes of 1, 3, 5, 7 and 9 are acceptable, but not recommended.

IW02 Anchorage - Anchorage Condition Rating

Inspection > Walls; Form W

Description:

This item indicates the condition of the wall anchorage system.

Procedure:

Select the code from the dropdown list which indicates the condition of the wall anchorage.

Coding:

Refer to CONDITION RATING CODES on the first page of this section.

IW03 Backfill/Damping - Backfill Condition Rating 📌

Inspection > Walls; Form W

Description:

This item indicates the condition of the backfill material.

Procedure:

Select the code from the dropdown list which indicates the condition of the backfill. This includes the relevant condition of settlement and washing of fines.

Coding:

Refer to CONDITION RATING CODES on the first page of this section.

IW04 Wall - Wall Condition Rating 📌

Inspection > Walls; Form W

Description:

This item indicates the condition of the retaining wall.

Procedure:

Select the code from the dropdown list which indicates the condition of the wall. This will include bulging, joint conditions, deterioration of face panels, connection of the backs, etc.

Coding:

Refer to CONDITION RATING CODES on the first page of this section .

IW05 Panel - Panel Condition Rating 📌

Inspection > Walls; Form W

Description:

This item indicates the condition of wall panels.

Procedure:

Select the code from the dropdown list which indicates the condition of the wall panel.

Coding:

Refer to CONDITION RATING CODES on the first page of this section .

IW06 Post - Post Condition Rating 📌

Inspection > Walls; Form W

Description:

This item indicates the condition of wall posts.

Procedure:

Select the code from the dropdown list which indicates the condition of the wall posts.

Coding:

Refer to CONDITION RATING CODES on the first page of this section .

IW07 Drainage - Drainage Condition Rating 📌

Inspection > Walls; Form W

Description:

This item indicates the condition of the drainage.

Procedure:

Select the code from the dropdown list which indicates the condition of the drainage of the wall. This will include the performance of the weep holes and drainage problems notes, staining, and ice damage.

Coding:

Refer to CONDITION RATING CODES on the first page of this section .

IW08 Foundation - Foundation Condition Rating 📌

Inspection > Walls; Form W

Description:

This item indicates the condition of the foundation.

Procedure:

Select the code from the dropdown list which indicates the condition of the foundation. Overall stability and settlement should be considered here.

Coding:

Refer to CONDITION RATING CODES on the first page of this section .

IW09 Parapets - Parapets Condition Rating 📌

Inspection > Walls; Form W

Description:

This item indicates the condition of parapets which are on top of the wall.

Procedure:

Select the code from the dropdown list which indicates the condition of the parapets.

Coding:

Refer to CONDITION RATING CODES on the first page of this section .

IW10 Overall - Overall Condition Rating of the Wall 📄

Inspection > Walls; Form W

Description:

This item indicates the condition of the structure. The overall rating of the structure should reflect the safety condition of the structure as it relates to the public safety. Some items may be rated "4" while the overall condition rating could be "6". For example, water staining or slight settlement is not sufficient to rate the overall condition as "poor".

Procedure:

Select the code from the dropdown list which indicates the condition of the structure.

Coding:

Refer to CONDITION RATING CODES on the first page of this section .

IW11 Notes - Wall Inspection Notes

Inspection > Walls; Form W

Description:

This item is used to record any narrative information that the inspector feels is necessary or may assist in the next inspection of the structure. Critical deficiencies that are identified from the inspection report should be noted here in a brief abbreviated format.

Procedure:

Record any narrative information that is necessary to identify inspection findings.

IW12 Next Inspection Type - Next Inspection Type for Wall Structure 📄

Inspection > Walls; Form W

Description:

This item is used to record the next type of inspection recommended to be performed on the wall structure.

Procedure:

Select the code from the dropdown list that describes the next type of inspection recommended to be performed on the wall structure.

Coding:

Refer to descriptions under inspection type for wall structure, item IW01.

IW13 Next Inspection Freq - Frequency of Inspection of Wall Structure

Inspection > Walls; Form W

Description:

This item is used to record the frequency of the wall structure inspection in months. This data field should reflect the same value as in 7A09.

Procedure:

Enter the frequency, in months that the wall is to be inspected.

Coding:

The inspection frequency, in months.

IW14 Next Inspection Date - Complete Next Inspection By This Date

Inspection > Walls; Form W

Description:

This item is used to record the date by which the next inspection is to be completed. This data field should reflect the same value as in 7A10.

Procedure:

Enter the date by which the next inspection is to be completed. This field may be calculated by the system by clicking on the "Calculate" button to the left of the field.

Coding:

Date by which the next inspection is to be completed in MM/DD/YYYY format:

MM 2 digit month
DD 2 digit day of month
YYYY 4 digit year

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FT Features Intersected - Utility

The Features Intersected - Utility screen is used to capture and display information related to utility features.

New Utility Feature records can be added using the "Create" button. One or more existing records can be deleted by selecting the features and clicking on the "Remove" button. A confirm deletion prompt will be displayed by the system before the records are removed. The "Save" button is used to commit pending changes on the screen, if any, to the database.

FT01 Utility Name - Name of Utility Company

Inventory > Features > Utility Detail

Description:

This item is used to record the name of the owner of the utility being referenced, relative to any utilities carried by the bridge.

Procedure:

Enter the name of the owner of the utility.

Coding:

Enter the name of the utility company in a narrative form.

FT02 Utility Type

Inventory > Features > Utility Detail

Description:

This item is used to record the type of utility being referenced.

Procedure:

Select the type of utility from the dropdown list.

Coding:

E	Electrical
G	Gas
S	Sewage
T	Telecommunications (includes Fiber optic cable, phone lines, cable lines, etc.)
W	Water

FT03 License Num - License Number of Utility Company(s) Carried by Bridge

Inventory > Features > Utility Detail

Description:

This item is used to record the license number of the utility.

Procedure:

Enter the license number which allows the utility to occupy the bridge.

Coding:

License number

FT04 License Issue Dt - Date the License Number Was Approved

Inventory > Features > Utility Detail

Description:

This item is used to enter the date the license was approved.

Procedure:

Enter the date that the license was approved.

Coding:

Date approved in MM/DD/YYYY format:

MM	2 digit month
DD	2 digit day of month
YYYY	4 digit year

FT05 Utility Weight - Total Weight of Utility in Kips

Inventory > Features > Utility Detail

Description:

This item is used to record the total weight of the utility in kips to the nearest tenth.

Procedure:

Enter the total weight of the utility, including all hardware, attached to the bridge.

Coding:

Total weight in kips to the nearest tenth.

FT06 Utility Addr - Address of Utility Company

Inventory > Features > Utility Detail

Description:

This item is used to record the address of the owner of the utility being referenced, relative to any utilities carried by the bridge.

Procedure:

Enter the address of the owner of the utility.

Coding:

The address of the utility company in a narrative form.

FT07 Hazmat - Hazmat Indicator

Inventory > Features > Utility Detail

Description:

This checkbox field is used to indicate whether or not the utility contains hazardous materials.

Procedure:

Check the box to indicate that the utility contains hazardous materials. Otherwise, the box should remain unchecked.

Coding:

Unchecked Hazardous materials are not present

Checked Hazardous materials are present

FT08 Location - Location of Utility

Inventory > Features > Utility Detail

Description:

This item is used to record a narrative description for the location of the utility on the structure.

Procedure:

Enter a narrative description for the location of the utility on the structure.

Coding:

Description for the location of the utility on the structure in narrative form.

Example:

Welded to diaphragms between Beams 3 and 4.

FT09 Contact Info - Contact Information

Inventory > Features > Utility Detail

Description:

This item is used to record information (name, phone number, etc.) about the point of contact for the utility.

Procedure:

Enter any known information for the point of contact for the utility.

Coding:

Point of contact information for the utility, such as name, phone number, or e-mail address.

FT10 Notes

Inventory > Features > Utility Detail

Description:

This item is used to record any additional information about the utility feature.

Procedure:

Enter any additional information about the utility feature in narrative form.

Coding:

Additional information about the utility feature in narrative form.

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FR Features Intersected - Railroad

The Features Intersected - Railroad screen is used to enter or edit data related to railroad features either on or under a structure. New railroad feature records can be added using the "Create" button. Existing features can be deleted by selecting the desired feature from the grid list and clicking on the "Remove" button. A confirm deletion prompt will be displayed by the system before the records are removed. The "Save" button is used to commit pending changes on the screen, if any, to the database.

FR01 RR Name - Name of Railroad

Inventory > Features > Railroad Detail

Description:

This item is used to record the name of the railroad.

Procedure:

Select the code for the name of the railroad from the dropdown list.

If the Feature Intersected is not a railroad, leave this item blank.

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Coding:

<u>Railroad Name</u>	<u>Railroad Name (cont)</u>
01 Aliquippa & Southern Railroad Company	50 Port Authority of Allegheny County (PAT)
02 Baltimore & Ohio Railroad Company, CYS, Chessie (CSX)	51 Southeastern Pennsylvania Transportation Authority (SEPTA)
03 Bellefonte Central Railroad Co.	52 Central Railroad Co. of New Jersey
04 Bessemer & Lake Erie Railroad Co.	53 Erie, Lackawanna Railroad Co. - Trustees
05 Cambria & Indiana Railroad Co.	54 Ironton Railroad Co.
06 Chestnut Ridge Railway Co.	55 Lackawanna & Wyoming Valley Railroad Company
07 Conemaugh 7 Black Lick Railroad Co.	56 Lehigh & Hudson River Railway Co.
08 Commonwealth of Pennsylvania	57 Lehigh & New England Railway Co. - Trustees
09 Consolidated Rail Corporation (CONRAIL) Pennsylvania RR	58 Lehigh Valley Railroad - Trustees
10 Central Railroad Co. of Pennsylvania	59 Pen Central Transportation Co. - Trustees
11 Delaware & Hudson Railway Co.	60 Reading Company - Trustees
12 East Erie Commercial Railroad	61 Allentown Terminal Railroad Co. - Trustees
13 The Everett Railroad Co.	62 East Broad Top Railroad & Coal Co.
14 Gettysburg Railroad Co.	63 Monessen Southwestern Railway Co.
15 Johnstown & Stonycreek Railroad Co.	64 Turtle Creek & Allegheny River Railroad Company
16 Stourbridge Railroad Co.	65 Wilkes-Barre Connecting Railroad
17 Lake Erie, Franklin & Clarion Railroad Co.	66 Lehigh Coal & Navigation Co.
18 Maryland & Pennsylvania Railroad Co.	67 Rail Tours, Inc.
19 McKeesport Connecting Railroad Co.	68 Cumberland Mine Railroad
20 Middletown & Hummelstown Railroad Co.	69 United States Steel Corporation (Private)
21 The Monongahela Connecting Railroad Co.	70 Con Agra (Private)
22 The Monongahela Railway Co.	71 Alcoa
23 Montour Railroad Company	72 Berwick Industrial Development Assoc.
24 National Railroad Passenger Corporation (AMTRAK)	73 New York, Susquehanna & Western Railroad Co.
25 New Hope & Ivyland Railroad Company	74 Can Do, Inc.
26 Norfolk & Western Railway Co.	75 Consolidated Coal Company, Inc.
27 Northampton & Bath Railroad Co.	76 Kovalchick Properties
28 Octoraro Railway Co.	77 Lykens Valley Railroad Co.
29 Philadelphia Belt Line Railroad	78 Pocono North East Railway, Inc.
30 Philadelphia, Bethlehem & New England Railroad Co.	79 Allegheny RR or Centre Co. Railway Co.
31 Pittsburgh, Allegheny & McKees Rocks Railroad Co.	80 Buffalo, Rochester Pittsburgh Railway Co.
32 Pittsburgh, Chartiers & Youghioghney Railway Co.	81 Blue Mountain & Reading Railroad Co.
33 The Pittsburgh & Lake Erie Railroad Co.	82 Buffalo & Pittsburgh R.R.
34 Pittsburgh and Ohio Valley Railway Co.	83 North Shore Railroad, Stourbridge Railroad Company
35 The Pittsburgh & Shawmut Railroad Co.	84 Knox & Kane
36 Steelton & Highspire Railroad Co.	85 Shamokin Valley R.R.
37 The Stewartstown Railroad Co. (not in service)	86 York Rail
38 Strasburg Railroad Co.	87 Pennswood
39 Towanda & Monroeton Shippers' Lifeline, Inc.	88 Nittany & Bald Eagle
40 Union Railroad Co. & Pennsylvania & West Virginia	89 Reading, Blue Mountain & Northern R.R.
41 Unity Railways Co.	90 Carbon & Schuylkill R.R.
42 Upper Merion & Plymouth Railroad Co.	91 Canadian Pacific Railroad Co.
43 Wanamaker, Kempton & Southern Railroad	92 Lackawanna Railroad Authority
44 Waynesburg Southern	97 Other
45 Waynesburg & Washington Railroad Co.	98 Abandoned Properties - Owners Unknown
46 Wellsville, Addison & Galetton Railroad Corp.	99 Inactive Private Properties
47 Western Maryland Railway Co.	
48 Winfield Railroad Company	
49 Youngstown & Southern Railway Co.	

FR02 (Not Used – Use Item 5C03)

FR03 Service Status - Service Status of Railroad

Inventory > Features > Railroad Detail

Description:

This item is used to record the service status of the railroad.

Procedure:

Select the code from the dropdown list for the service status of the railroad.

If the feature intersected is not a railroad, leave this item blank.

Coding:

- 1 In Service
- 2 Out of Service – No PUC or ICC Abandonment Action
- 3 Out of Service – Under PUC or ICC
- 4 Officially Abandoned

Note:

Railroad information in the BMS2 System should not be deleted until a formal PUC order for elimination of crossing is issued.

FR04 RR Milepost - Railroad Milepost

Inventory > Features > Railroad Detail

Description:

This item is used to enter the railroad milepost at which the structure is located. Locating a structure by milepost is similar to the milepost system used on our Interstate Highway routes.

Procedure:

Enter the railroad milepost at which the structure is located, including the line abbreviation. This field will be read-only if a valid AAR DOT Number is entered in Field FR05.

Coding:

Railroad line abbreviation and railroad milepost to the nearest hundredth of a mile.

Example: McClay Street Bridge in Harrisburg, crossing Norfolk Southern's Pittsburgh line at milepost 106.04. Code PT106.04.

FR05 AAR DOT Num - Assoc. of American Railroads Identifying Number

Inventory > Features > Railroad Detail

Description:

This item indicates the unique identifying number for the specific railroad-highway crossing assigned during a previous inventory by railroad personnel.

Procedure:

Enter the AAR (Association of American Railroads) Number for the specific railroad-highway crossing. This number is comprised of 6 numbers plus a letter. If the number does not exist in Grade Crossing EDMS (GCEDEMS), a validation will pop-up and not allow the entry of the DOT number in the field. A valid DOT number will populate Items FR04 and FR17 through FR20 if the information is available from GCEDEMS.

Coding:

Enter the AAR Number for the specific structure.

FR06 Num of Electrified Tracks - Number of Electrified Railroad Tracks

Inventory > Features > Railroad Detail

Description:

This item is used to record the number of electrified railroad tracks for each railroad feature being recorded.

Procedure:

Enter the number of electrified railroad tracks for each railroad feature being recorded

Coding:

The number of electrified railroad tracks.

FR07 Total Num of Tracks - Total Number of Railroad Tracks

Inventory > Features > Railroad Detail

Description:

This item is used to record the total number of railroad tracks for the feature.

Procedure:

Enter the total number of tracks.

Coding:

The total number of railroad tracks.

FR08 Span Desc - Span Description

Inventory > Features > Railroad Detail

Description:

This item is used to record the description of which span(s) the railroad tracks cross under.

Procedure:

Enter description of which span(s) the railroad tracks cross under.

Coding:

Narrative description of the span(s) the railroad tracks cross under.

FR09 Additional Operator

Inventory > Features > Railroad Detail

Description:

This narrative item is used to record a description of other railroad companies that may use the feature.

Procedure:

Enter a description of any other railroad companies that may use the feature (e.g. lease of track rights).

Coding:

Description of any other railroad companies that may use the feature in narrative form.

Items FR10 to FR15, clearance data for railroads, may be entered on this screen or the Agency - Roadways Screen, in Items 6C18 to 6C23.

FR10 (Not Used - Reserved for Future Use)***FR11 Min Over Vert (Right) - Minimum Vertical Clearance for the Right Railroad**

Inventory > Features > Railroad Detail

Description:

This item is used to record the actual minimum vertical clearance over the railroad to any restriction, to the nearest hundredth of a foot.

Procedure:

If the feature beneath the structure is a railroad ⁽¹⁾, enter the vertical clearance from the railroad track to the underside of the superstructure.

Coding:

9999 When no restriction exists
9912 When a restriction is 100 feet or greater

Note:

Measurements should be from the edge of through lane for the under feature and from the curb line for the on feature.

(1) For Railroad Abandonment if there is no abandonment order for the railroad in the District files, the vertical clearance is to be coded even if the tracks have been removed.

FR12 (Not Used - Reserved for Future Use)

***FR13 Horiz (Right) - Total Horizontal Clearance for the Right Railroad**

Inventory > Features > Railroad Detail

Description:

This item is used to record the total horizontal clearance for the railroad.

Procedure:

The total horizontal clearance should be the available clearance measured between the edge of the rail and the structural feature limiting the railroad ⁽²⁾.

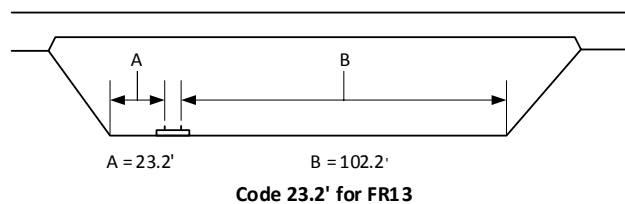
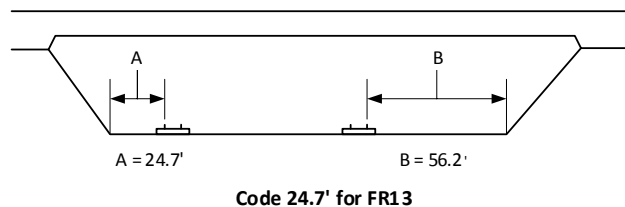
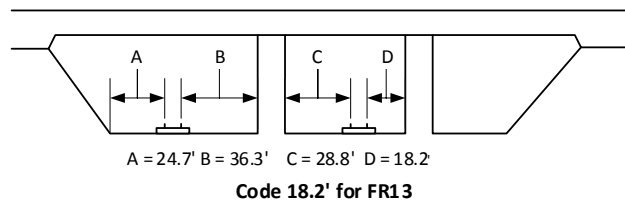
Coding:

The total horizontal clearance to the nearest tenth of a foot.

- 9999 When no restriction exists
- 9912 When a restriction is 100 feet or greater
- Blank Not applicable

Note:

(2) For Railroad Abandonment if there is no abandonment order for the railroad in the District files, the horizontal clearance is to be coded even if the tracks have been removed.



FR14 (Not Used – Reserved for Future Use)**FR15 (Not Used – Reserved for Future Use)****FR16 Notes**

Inventory > Features > Railroad Detail

Description:

This item is used to record any comments about the feature.

Procedure:

Enter any comments about the feature in narrative form.

FR17 RR Division – Railroad Division

Inventory > Features > Railroad Detail

Description:

This item is used to record the Railroad Division of the Owner listed in FR20 – Railroad Owner.

Procedure:

This item will be automatically filled in by the system based on information posted in FR05 – AAR DOT number. If FR05 is not filled in, this field will remain blank. If FR05 is completed, this field will be populated if Grade Crossing EDMS has a Railroad Division associated with the grade crossing identified in FR05.

FR18 RR Subdivision – Railroad Subdivision

Inventory > Features > Railroad Detail

Description:

This item is used to record the Railroad Subdivision of the Owner listed in FR20 – Railroad Owner.

Procedure:

This item will be automatically filled in by the system based on information posted in FR05 – AAR DOT number. If FR05 is not filled in, this field will remain blank. If FR05 is completed, this field will be populated if Grade Crossing EDMS has a Railroad Subdivision associated with the grade crossing identified in FR05.

FR19 RR Branch – Railroad Branch

Inventory > Features > Railroad Detail

Description:

This item is used to record the Railroad Branch of the Owner listed in FR20 – Railroad Owner.

Procedure:

This item will be automatically filled in by the system based on information posted in FR05 – AAR DOT number. If FR05 is not filled in, this field will remain blank. If FR05 is completed, this field will be populated if Grade Crossing EDMS has a Railroad Branch associated with the grade crossing identified in FR05.

FR20 RR Owner – Railroad Owner

Inventory > Features > Railroad Detail

Description:

This item is used to record the Railroad Owner recorded in Grade Crossing EDMS.

Procedure:

This item will be automatically filled in by the system based on information posted in FR05 – AAR DOT number. If FR05 is not filled in, this field will remain blank. If FR05 is completed, this field will be populated if Grade Crossing EDMS has a Railroad Owner associated with the grade crossing identified in FR05.

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FW Features Intersected - Waterway

The Features Intersected - Waterway screen is used to view or edit data related to waterways passing under a structure.

New waterway feature records can be added using the "Create" button. Existing features can be deleted by selecting the desired feature from the grid list and clicking on the "Remove" button. A confirm deletion prompt will be displayed by the system before the records are removed. The "Save" button is used to commit pending changes on the screen, if any, to the database.

FW01 Stream Name - Name of the Stream (Creek, River, etc.) 📄

Inventory > Features > Waterway Detail

Description:

This item is used to record the name of the stream in narrative form.

Procedure:

Enter the name of the stream which the bridge passes over. If the name of the stream is not known, it should be indicated as a tributary to a known stream name.

Coding:

A narrative description of the name of the stream.

FW02 Stream Classification 1

Inventory > Features > Waterway Detail

Description:

This item is used to record the Department of Environmental Protection (DEP) stream classification.

Procedure:

Select the DEP stream classification from the dropdown list. If the stream has more than one classification, enter the one classification in this item and record the subsequent classification(s) in items FW03 and FW05.

Coding:

Aquatic Life Classification

CWF	Cold Water Fishes
MIF	Migratory Fishes
TSF	Trout Stocking
WWF	Warm Water Fishes

Water Supply Classification

IRR	Irrigation
IWS	Industrial Water Supply
LWS	Livestock Water Supply
PWS	Potable Water Supply
WWS	Wildlife Water Supply

Recreation and Fish Consumption

AES	Aesthetics
BOA	Boating
FSH	Fishing
WCS	Water Contact Sports

Special Protection

EVW Exceptional Value Waters

HIQ High Quality

Other

NAV Navigation

FW03 Stream Classification 2

Inventory > Features > Waterway Detail

Description:

This item is used to record the second stream classification.

Procedure:

Select the second stream classification from the dropdown list.

Coding:

Refer to FW02.

FW04 Timeframe

Inventory > Features > Waterway Detail

Description:

This item is reserved for future use.

FW05 Stream Classification 3

Inventory > Features > Waterway Detail

Description:

This item is used to record the third stream classification.

Procedure:

Select the third stream classification from the dropdown list.

Coding:

Refer to FW02.

FW06 Permit Type

Inventory > Features > Waterway Detail

Description:

This item is used to record the type of permit required based on the stream classification.

Procedure:

Enter a description of the type of permit required to perform work in the stream in narrative form.

Coding:

Type of permit required to perform work in the stream in narrative form.

FW07 Drainage Area - Drainage Area of Stream

Inventory > Features > Waterway Detail

Description:

This item is used to record the drainage area of the stream passing under the bridge.

Procedure:

Enter the drainage area to the nearest tenth of a square mile for the stream passing under the bridge. The area may be obtained from the design drawings, measured, or may be estimated.

Coding:

The drainage area of the stream to the nearest tenth of a square mile.

FW08 Fishable - Is the Stream Fishable (Stockable)?

Inventory > Features > Waterway Detail

Description:

This checkbox field indicates whether or not a stream is fishable. A fishable stream is one that is stockable.

Procedure:

A list of stockable streams can be found on the Pennsylvania Boat and Fish Commission's website. If the stream is fishable (stockable), check the box. If the stream is not fishable (stockable), or if this item is not applicable, leave the box unchecked.

Coding:

Unchecked The stream is not fishable (stockable) or not applicable
Checked The stream is fishable (stockable)

FW09 Water Flow Direction

Inventory > Features > Waterway Detail

Description:

This item is used to record the direction of water flow looking segments ahead.

Procedure:

Select the direction of water flow from the dropdown list. The direction of water flow should be recorded looking segments ahead.

Coding:

L Water flows from Right side of bridge to Left side of bridge
R Water flows from Left side of bridge to Right side of bridge
U Unknown water flow direction

FW10 Primary Waterway

Inventory > Features > Waterway Detail

Description:

This checkbox field indicates whether or not the waterway is the primary waterway.

Procedure:

If the stream is the primary waterway, check the box. If the stream is not the primary waterway, leave the box unchecked. Only one waterway may be the primary waterway.

Coding:

- Unchecked The waterway is not the primary waterway
- Checked The waterway is the primary waterway

FW11 Vertical Clearance - Nominal Vertical Clearance Streambed to Structure

Inventory > Features > Waterway Detail

Description:

This item is used to record the nominal vertical clearance from the streambed to the underside of the structure.

Procedure:

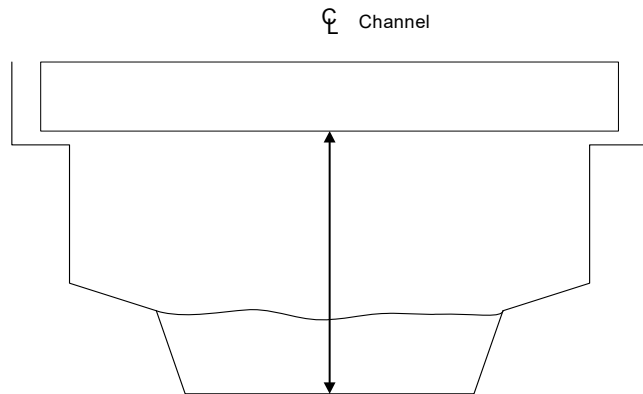
The nominal vertical clearance is the vertical clearance from the streambed, preferably at the centerline of the stream, to the underside of the structure.

Coding:

Enter the nominal vertical clearance to the nearest tenth of a foot. Enter 9990 when restriction is $\geq 99.9'$.

Example:

Assume a nominal vertical clearance of 11'-7"



FW12 Max W.S. Elevation - Maximum Known Water Surface Elevation

Inventory > Features > Waterway Detail

Description:

This item is used to record the maximum known water surface elevation.

Procedure:

Enter the maximum known water surface elevation. If a maximum water surface elevation is not available, this item may be left blank.

Coding:

The maximum known water surface elevation to the nearest tenth of a foot.

FW13 Max W.S. Elevation Year - Maximum Known Water Surface Elevation Year

Inventory > Features > Waterway Detail

Description:

This item is used to record the year in which the maximum known water surface elevation occurred.

Procedure:

Enter the year in which the maximum water surface elevation occurred. If a maximum water surface elevation is not available, this item may be left blank.

Coding:

The year in which the maximum known water surface elevation occurred.

FW14 Magnitude - Design Flood Magnitude

Inventory > Features > Waterway Detail

Description:

This item is used to record the magnitude of the design flood for a stream passing under a bridge.

Procedure:

Enter the magnitude of the flow. Refer to the Hydraulic Analysis of the structure if available.

Coding:

Magnitude of design flood in cubic feet per second (cfs).

FW15 Elevation - Design Flood Elevation

Inventory > Features > Waterway Detail

Description:

This item is used to record the design flood elevation data for a stream passing under a bridge.

Procedure:

Enter the pertinent water elevation. Refer to the Hydraulic Analysis of the structure if available.

Coding:

Design flood elevation to the nearest tenth of a foot.

FW16 Frequency - Design Flood Frequency

Inventory > Features > Waterway Detail

Description:

This item is used to record the frequency of the design flood for a stream passing under a bridge.

Procedure:

Enter the design flood frequency. Refer to the Hydraulic Analysis of the structure if available.

Coding:

Design flood frequency in years.

FW17 Velocity - Design Flood Velocity

Inventory > Features > Waterway Detail

Description:

This item is used to record design flood velocity data for a stream passing under a bridge.

Procedure:

Enter the velocity at design discharge. Refer to the Hydraulic Analysis of the structure if available.

Coding:

Design flood velocity to the nearest tenth of a foot per second (fps) as shown in the Hydraulic Analysis Report.

FW18 Pollutant Desc - Pollutants Description

Inventory > Features > Waterway Detail

Description:

This item is used to record a description of any pollutants in the waterway.

Procedure:

Enter a description of any known pollutants in the waterway in narrative form.

Coding:

Narrative description of any known pollutants in the waterway.

FW19 Stream Restrict Desc - Stream Restrictions

Inventory > Features > Waterway Detail

Description:

This item is used to record a narrative description for any restriction on entering the waterway.

Procedure:

Enter a narrative description for any restriction on entering the waterway.

Coding:

Narrative description for any restriction on entering the waterway.

FW20 Notes

Inventory > Features > Waterway Detail

Description:

This item is used to record any notes on the waterway.

Procedure:

Enter a narrative description for any additional notes on the waterway.

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SP APRAS Span - Span

The APRAS Span - Span screen is used to enter and display information related to the spans for a specific structure.

The Span section lists the unique spans for the selected structure. By default, the span tab will display all records for a selected bridge in a tabular form. The records can be sorted for each column by clicking on the desired column heading. Clicking on the column heading a second time will sort the records in descending order.

New span or dataset/analysis information can be added using the "Create" button. Existing records can be deleted by selecting one or more span records and clicking on the "Remove" button. A confirm deletion prompt will be displayed by the system before the records are removed. The "Save" button is used to commit pending changes on the screen, if any, to the database.

When converting data from BMS to BMS2, identifying the approach and main spans in sequential order of increasing offsets/segments/mileposts for multi-span bridges was not possible from the data in old BMS item C16. For the data transfer of BMS to BMS2, BMS2 created the same number of lines as the total number of spans that was recorded in Item C16 of BMS. Each span was assigned a Span Type (SP01) of Main. Districts should review and revise items SP01 to SP06 as required.

In addition to creating a line item for every span identified in old item C16, a line item for each APRAS Span Data from the old BMS PA screen was also created. The reason for this was because in BMS2 all spans must be linked to a specific structure unit. Again, the data conversion from BMS to BMS2 was unable to associate the APRAS Span data to the corresponding spans identified in C16. All APRAS Span Types for bridges shall eventually be removed. Sign Structures, Walls, etc. will continue to use the APRAS Span Type. **APRAS Span types shall only be removed after each APRAS Span ID on the APRAS Span tab has been assigned to a main or approach span.** See the APRAS Span - APRAS Span page for more information on span assignments.

Note that when any span is removed or added on this screen, the change will automatically occur on the Inventory - Structure Units screen (5D screen).

SP01 Type - Span Type

Inventory > Structure Units

Description:

This item is used to record the span member and the main or approach span.

Procedure:

This item will be automatically filled in by the system based on information entered in item 5D04.

SP02 Unit ID

Inventory > Structure Units

Description:

This item is used to record the span label.

Procedure:

This item will be automatically filled in by the system based on information entered in item 5D02.

SP03 Span Length

Inventory > Structure Units

Description:

This item is used to record the center-to-center of bearing span length.

Procedure:

Enter the center to center of bearing span length in feet to the nearest hundredth.

For splayed beams or curved girder bridges enter the length which best represents the span length for permit load analysis.

Coding:

Enter the length of the span in feet to the nearest hundredth.

Examples:

96'-3" span

88.48' span

SP04 Span Deck Width

Inventory > Structure Units > Structure Unit/Span Detail

Description:

This item is used to record the width of the span measured as the out-to-out width of a bridge deck.

Procedure:

Enter the out-to-out width of the bridge deck. The measurement should be exclusive of flared areas for ramps, i.e., it should be the minimum or nominal width. For thru type (truss or girder) bridges, enter the width which represents the lateral clearance between superstructure members. Where traffic runs directly on the top slab (or wearing surface) of a culvert, e.g., an R/C box without fill, enter actual width (out-to-out). This also applies where fill is minimal and culvert headwalls affect the flow of traffic.

This item does not apply where the roadway is on a fill across a culvert where the culvert headwalls do not affect the flow of traffic. In this case, code "0" for not applicable.

For a highway tunnel (item 6A29, Department Structure Type, is 29), enter the width between the wall of the tunnel.

See the sketches following item 5B05.

Coding:

The out-to-out width, to the nearest tenth of a foot.

SP05 Span Flared - Flare Indicator

Inventory > Structure Units > Structure Unit/Span Detail

Description:

This checkbox field indicates whether or not the width of the bridge varies.

Procedure:

Generally, such variance will result from ramps converging with or diverging from the through lanes on the bridge, but there may be other causes. Minor flares at the ends of the structure should be ignored.

Coding:

Unchecked Bridge width does not vary
Checked Bridge width varies

SP06 Span Description

Inventory > Structure Units > Structure Unit/Span Detail

Description:

This item is used to record a description of the span(s).

Procedure:

Enter a narrative description of the span identified in item SP01.

Coding:

Narrative description of the span identified in item SP01.

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SP07 to SP10 Dept Material Type, Dept Physical Type, Dept Span Inter, Dept Struc Config - Department Structure Type

Inventory > Structure Units > Structure Unit/Span Detail

Description:

This series of four fields is used to indicate the kind of material, whether or not there is composite action, continuity and basic structural configuration for the span.

Procedure:

The general description of each field is as follows:

SP07	Material makeup of main load carrying members(1)
SP08	Physical makeup of primary load carrying members (when appropriate, or subcomponents of a major bridge) (2)
SP09	Type of span interaction of main members only
SP10	Structural Configuration

(1) Main Members are any primary load carrying members that span between substructure supports.

Primary Load Carrying Members are any bridge members that receive vehicular live load.

Secondary Members are bridge members that do not receive vehicular live load.

(2) Subcomponent Members include all primary load carrying members that are not main members.

Coding:

See coding for Items 6A26 to 6A29.

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SS APRAS Span - Apras Span

The APRAS Span – Apras Span screen is used to enter and display information related to the spans for a specific structure.

The APRAS Span section lists the unique spans for the selected structure. By default, the span tab will display all records for a selected bridge in a tabular form. The records can be sorted for each column by clicking on the desired column heading. Clicking on the column heading a second time will sort the records in descending order.

New span or dataset/analysis information can be added using the "Create" button. Existing records can be deleted by selecting one or more span records and clicking on the "Remove" button. A confirm deletion prompt will be displayed by the system before the records are removed. The "Save" button is used to commit pending changes on the screen, if any, to the database.

The data conversion from BMS to BMS2 was unable to assign the APRAS Span ID to the corresponding spans identified in old BMS item C16. Therefore, all APRAS Span IDs were assigned to an "APRAS" span type in Item SP01. The "APRAS" span type was to serve as a temporary assignment for bridges until the APRAS span IDs could be assigned to a "Main" or "Approach" Span Type. **APRAS Span ID assignments shall be changed to the applicable "Main" or "Approach" span number for bridges only. After the assignment has been changed and saved, the user must then remove each APRAS Span ID on the APRAS Span tab.** Sign Structures, Walls, etc. shall continue to utilize the APRAS Span ID. See the APRAS Span – Span page for more information on span types.

SS01 Span ID – Apras Span ID

Other > APRAS Data > APRAS Spans

Description:

This is a required 4 digit field used to individually identify each unique span of the bridge. The first two digits are used to designate the span number. The third digit is used to designate the engineering program used to analyze the span. The fourth digit is used to alert APRAS of special conditions or to identify different analysis datasets available for the span. Identical adjacent spans may be referenced in BMS2 item SS04 which will eliminate the need for duplicating data on separate lines.

Procedure:

Enter the four digit APRAS Span ID.

Coding:

Each Span ID must be unique and all digits must be entered.

First-Second Digit: **Span No.**

These characters must be numeric. The first entry must be "01" and the following entries must be numbered sequentially with the exception of spans identified as identical spans. Each span should be identified one time only, with the exception of cases where the load carrying capacity of opposing lanes of traffic is significantly different. In such cases the span number may be repeated once and data may be input for the "back span" (decreasing segment direction). If this is done item SS04 – Identical Spans must be coded as BK for the back span. Spans coded as backspans must also have a unique SPAN ID. The 3rd and/or 4th digit must be different. The total number of spans listed including those identified as identical spans must not exceed the total number of Spans (Item SS13). Acceptable values are 01 to 99.

Third Digit: Analysis Method

This value identifies the PennDOT Engineering Program used to analyze the span of other rating methods as referenced were used.

A	Bridge Analysis and Rating, (BAR-7)	G-V	Reserved
B	Prestressed Concrete Girder, (PS3)	W	Bridge capacity based on engineering judgment
C	Box Culvert, (BOX5)	X	Bridge capacity based on engineering computations or other software
D	LRFD Steel Girder Design and Rating (STLRFD)		
E	LRFD Prestressed Concrete Girder Design and Rating (PSLRFD)	Y	Bridge capacity based on higher order analysis (FEM, 2 Dimensional Grillage). Permit vehicles may be reviewed using live load distribution factors (see DM4 3.23, 2.1.1P)
F	LRFD Box Culvert Design and Rating (BXLRFD)	Z	Other

Fourth Digit:

This value designates the version of the bridge analysis data set to be used by APRAS for "routine" analysis. This value is also used to instruct APRAS if any special procedures are required.

1-9 Reference data set versions.

- A Moment comparison check is to be performed by APRAS. No bridge rating datasets are to be used.
- C Clearance data only. No capacity review required. To be used for any obstruction that may restrict a permit vehicle. It may also be used in instances where spans have identical load carrying capacity and otherwise would have to be repeated to describe different clearance conditions.
- M Manual review required before APRAS may issue a permit for this span. APRAS will conduct all normal reviews based on the data available. If the automatic analysis fails, APRAS will not call for manual review.
- N No capacity review required by APRAS. To be used for structures under fill, or to avoid providing detailed load data for a span which is identical to one which has already been entered.
- P Bridge is posted. APRAS will not allow any permit vehicles to cross.
- T Bridge posted "One truck at a time". APRAS will not allow any permit vehicles to cross.

SS02 Actual Span 

Other > APRAS Data > APRAS Spans

Description:

The Actual Span item allows the user to specify which physical span / structure unit is to be associated with the APRAS Span ID.

Procedure:

For the APRAS Span ID select the span from the dropdown list

Coding:

The dropdown list for the Actual Span will only have those that are defined on the SP screen (Span screen).

SS03 Back Span - Back Span Indicator

Other > APRAS Data > APRAS Spans

Description:

This checkbox field indicates whether or not the span is a "back-span".

Procedure:

In such cases the data associated with the Span ID will be used by APRAS to describe the conditions of the span in the decreasing segment direction. Spans which are coded as "back-spans" may not be identical.

Coding:

Unchecked Span is not a "back-span"
Checked Span is a "back-span"

Note:

In BMS, if a back-span was being described, the letters "BK" were entered in the Identical Spans (PA05) item.

SS04 Ident Span - Identical Span No. 📌

Other > APRAS Data > APRAS Spans

Description:

This item is used to identify multiple identical adjacent spans (and rating files) to avoid repeating lines of data.

Procedure:

To identify a group of adjacent identical spans without coding each span individually, code the span number of the last span of the group. The total number of spans listed, including those identified under Item SS01, must not exceed the total number of spans from item SS13.

Coding:

Enter the span number of the last span in a group of identical spans.

Leave blank if the span is not part of an identical adjacent group.

Note:

For spans to be identical they must be the same for length, load carrying capacity and clearance data.

SS05 Beg Cont - Continuous Beginning Span

Other > APRAS Data > APRAS Spans

Description:

This item is used to identify the beginning span number for a group of continuous spans.

Procedure:

For each Span ID, enter the beginning span number of the group of spans that are continuous.

Coding:

Number of the beginning span in a continuous group.

All coding is numeric. The numbers shown may not exceed the total number of spans. Coding should only be done for the first span in a group of continuous spans. This item should be left blank for all other spans in the group.

Leave blank if the span is simply supported.

For P/S bridges continuous for live load only, classify as simple span if rated as simple beams.

SS06 End Cont - Continuous End Span

Other > APRAS Data > APRAS Spans

Description:

This item is used to identify the end span number for a group of continuous spans.

Procedure:

For each SPAN ID, enter the end span number of the group of spans that are continuous.

Coding:

Number of the end span in a continuous group.

All coding is numeric. The numbers shown may not exceed the total number of spans. Coding should only be done for the first span in a group of continuous spans. This item should be left blank for all other spans in the group.

Leave blank if the span is simply supported.

For P/S bridges continuous for live load only, classify as simple span if rated as simple beams.

[the remainder of this page is intentionally left blank]

EXAMPLE 1: Simple Span Structure

SS01 APRAS Span ID	SS02 Actual Span	SS03 Back-Span	SS04 Identical Span No	SS05 Begin Continuous	SS06 End Continuous
01B1	Main 1		01		

EXAMPLE 2: 4 Simple Spans, Identical for Spans 2 and 3, non-continuous

SS01 APRAS Span ID	SS02 Actual Span	SS03 Back-Span	SS04 Identical Span No	SS05 Begin Continuous	SS06 End Continuous
01A1	Main 1		01		
02A1	Main 2		03		
04A1	Main 3		04		

EXAMPLE 3: 5 Spans, Identical for Spans 2 and 3, Continuous for 2 to 4

SS01 APRAS Span ID	SS02 Actual Span	SS03 Back-Span	SS04 Identical Span No	SS05 Begin Continuous	SS06 End Continuous
01A1	Main 1		01		
02A1	Main 2		03	02	04
04A1	Main 4		04		
05A1	Main 5		05		

EXAMPLE 4: Two span structure, where Span 1 segments ahead and segments back have significantly different load carrying capacities. No back spans are required for Span 2.

SS01 APRAS Span ID	SS02 Actual Span	SS03 Back-Span	SS04 Identical Span No	SS05 Begin Continuous	SS06 End Continuous
01A1	Main 1		01		
01A2	Main 1	√			
02A2	Main 2		02		

EXAMPLE 5: Two span structure, where Span 2 eastbound fascia beam has suffered collision damage and has a lower capacity than the westbound lane.

SS01 APRAS Span ID	SS02 Actual Span	SS03 Back-Span	SS04 Identical Span No	SS05 Begin Continuous	SS06 End Continuous
01W1	Main 1		01		
02W1	Main 2		02		
02W2	Main 2	√			

EXAMPLE 6: Sign Structure

SS01 APRAS Span ID	SS02 Actual Span	SS03 Back-Span	SS04 Identical Span No	SS05 Begin Continuous	SS06 End Continuous
01ZC	Apras 01ZC		01		

SS07 C-C-Len - Center to Center Span Length

Other > APRAS Data > APRAS Spans

Description:

This item is used to record the center-to-center of bearing span length.

Procedure:

Enter the center to center of bearing span length in feet to the nearest hundredth.

For splayed beams or curved girder bridges enter the length which best represents the span length for permit load analysis.

Coding:

Enter the length of the span in feet to the nearest hundredth.

Examples:

106'-3" span	<input type="text" value="106.25"/>
88.48' spa	<input type="text" value="088.48"/>

SS08 Mom Comp Len - Moment Comparison Span Length

Other > APRAS Data > APRAS Spans

Description:

This item is used to record the portion of a simple span that is loaded to produce maximum stress in the controlling member when computing the Load Moment Comparison Factor. This portion represents the length of the contributing area on the span's influence line.

Procedure:

This is a numeric item and should be coded only when:

- Moment Comparison Factor method is applicable.
- If the analysis length is less than the full span length.
- Span configuration is for a simple stringer or longitudinal girder.

Coding:

Enter the portion of a simple span that is loaded to produce maximum stress in the controlling member when computing the Load Moment Comparison Factor to the nearest hundredth of a foot.

Leave blank if not applicable.

SS09 Dept Struc Typ - Department Structure Type

Other > APRAS Data > APRAS Spans

Description:

This item is used to indicate the kind of material, whether or not there is composite action, continuity and basic structural configuration for the span.

Procedure:

The general description of each subfield is as follows:

First Field	Material makeup of main load carrying members(1)
Second Field	Physical makeup of primary load carrying members (when appropriate, or subcomponents of a major bridge) (2)
Third Field	Type of span interaction of main members only
Fourth Field	Structural Configuration

(1) Main Members are any primary load carrying members that span between substructure supports.

Primary Load Carrying Members are any bridge members that receive vehicular live load.

Secondary Members are bridge members that do not receive vehicular live load.

(2) Subcomponent Members include all primary load carrying members that are not main members.

Coding:

See coding for Items 6A26 to 6A29.

SS10 Notes

Other > APRAS Data > APRAS Spans

Description:

This item is used to record notes about the span.

Procedure:

Enter any notes about the span in narrative form.

Coding:

Notes about the span in narrative form.

SS11 APRAS Ref

Other > APRAS Data > APRAS Spans > APRAS - Detail Span Information

Description:

This item is optional to identify the feature intersected. It will be used in the APRAS bridge details screen.

Procedure:

Enter a brief description of the feature intersected.

Coding:

Brief description of the feature intersected

Example:

Over Interstate 83

SS12 Axle Weight

Other > APRAS Data > APRAS Spans > APRAS - Detail Span Information

Description:

This item records the maximum axle weight allowed on the bridge.

Procedure:

Enter the maximum single axle weight allowed on the bridge (in kips).

Coding:

Maximum single axle weight in kips. Leave blank if there are no axle weight restrictions. 50 kips is the maximum allowable value.

Example:

A bridge whose maximum axle weight is 20 kips: kips

Code: 20

SS13 Total APRAS Span

Other > APRAS Data > APRAS Spans > APRAS - Detail Span Information

Description:

This item records the total number of spans.

Procedure:

Enter the total number of APRAS spans.

Coding:

Total number of spans.

SL APRAS Span - Load Capacity

The APRAS Span - Load Capacity screen records and displays load capacity data related to a Span/Dataset required to support APRAS and ABAS bridge analysis. The screen is viewed via the APRAS Data screen.

By default the screen displays all the load rating information for the current Span/Dataset ID. The user can also view and enter load rating information for another span by selecting the Span/Dataset ID from the drop down list. The Create button allows users to add a new load rating info for a span. After an add operation is performed the user must click on the Save button to save the records in the database. Users may only select one at a time and use the remove button to delete the records. Users will be prompted by the system to confirm deletion before the records are removed.

SL01 Rating Date - Date the Ratings Were Computed

Other > APRAS Data > APRAS Span > Load Capacity

Description:

This required item is used to record the date that the inventory and operating ratings were computed.

Procedure:

This date will be automatically entered with the current date when any data item is updated on the Load Capacity or Load Capacity Details screen.

Coding:

Date computed: month, day, year.

SL02 DF Moment Norm - Multi-Lane Live Load Distribution Factors for Moment

Other > APRAS Data > APRAS Span > Load Capacity

Description:

This item is used to record the live load distribution factors for moment at the point of maximum moment for multi-lane traffic. Refer to current AASHTO Standard Specifications for Highway Bridges for distribution factor equations.

Coding:

Enter the live load moment distribution factor expressed as a fraction of the wheel load to be applied for multi-lane (normal) traffic.

SL03 DF Moment Single - Single Vehicle Live Load Distribution Factors for Moment

Other > APRAS Data > APRAS Span > Load Capacity

Description:

This item is used to record the live load distribution factors for moment at the point of maximum moment for a single vehicle. Refer to current AASHTO Standard Specifications for Highway Bridges for distribution factor equations.

Coding:

Enter the live load moment distribution factors expressed as a fraction of the wheel load to be applied for traffic restricted to one truck at a time.

Note:

For some narrow bridges and ramps the DF for normal traffic (Item SL02) may already be based on one truck at a time - In such cases, leave this item blank.

SL04 DF Shear Norm - Multi-Lane Live Load Distribution Factors for Shear

Other > APRAS Data > APRAS Span > Load Capacity

Description:

This item is used to record the live load distribution factors for shear at the point of maximum shear for multi-lane traffic.

Coding:

Enter the live load shear distribution factors expressed as a fraction of the wheel load to be applied for multi-lane (normal) traffic.

SL05 DF Shear Single - Single Vehicle Live Load Distribution Factors for Shear

Other > APRAS Data > APRAS Span > Load Capacity

Description:

This item is used to record the live load distribution factors for shear at the point of maximum shear for a single vehicle.

Coding:

Enter the live load distribution factors expressed as a fraction of the wheel load to be applied for traffic restricted to one truck at a time.

Note:

For some narrow bridges and ramps the DF for normal traffic (Item SL04) may already be based on one truck at a time - In such cases, leave this item blank.

SL06 Pos Mom Comp Factor - Positive Moment Comparison Factor Comment (Normal Traffic)

Other > APRAS Data > APRAS Span > Load Capacity

Description:

This item is used to record the positive moment comparison factor for span capacity under normal traffic.

Procedure:

The Capacity Moment Comparison Factor (CMCF) is defined as the ratio of the moment capacity of the span to the maximum moment caused by the HS20 loading at the point of maximum moment.

Coding:

CMCF of span under normal traffic.

SL07 Pos Mom Comp Rest - Positive Moment Comparison Factor Comment (Restricted Traffic)

Other > APRAS Data > APRAS Span > Load Capacity

Description:

This item is used to record the positive moment comparison factor for span capacity under restricted traffic.

Procedure:

The Capacity Moment Comparison Factor Comment (CMCFC) is the ratio of the moment capacity of the span to the maximum moment caused by the HS20 vehicle at the point of maximum moment modified to allow increased capacity. The conditions by which the span may be crossed are defined in Item SL10 - Load Conditions.

Coding:

CMCFC of span when restrictions (load conditions - see Item SL10) are placed on the permit vehicle.

SL08 Neg Mom Comp Factor Norm - Negative Moment Comparison Factor Comment (Normal Traffic)

Other > APRAS Data > APRAS Span > Load Capacity

Description:

This item is used to record the negative moment comparison factors for span capacity under normal traffic.

Procedure:

The Capacity Moment Comparison Factor Negative (CMCF(-)) is defined as the ratio of the moment capacity of the span to the maximum moment caused by the HS20 loading at the point of maximum negative moment.

Coding:

CMCF(-) of span under normal traffic.

SL09 Neg Mom Comp Factor Rest - Negative Moment Comparison Factor Comment (Restricted Traffic)

Other > APRAS Data > APRAS Span > Load Capacity

Description:

This item is used to record the negative moment comparison factors for span capacity under restricted traffic.

Procedure:

The Capacity Moment Comparison Factor Comment Negative (CMCFC(-)) is the ratio of the moment capacity of the span to the maximum moment caused by the HS20 vehicle at the point of maximum negative moment modified to allow increased capacity. The conditions by which the span may be crossed are defined in Item SL16-Load Conditions.

Coding:

CMCFC(-) of span when restrictions (load conditions - see Item SL10) are placed on the permit vehicle.

SL10 Load Condition - Load Conditions for the Permit

Other > APRAS Data > APRAS Span > Load Capacity

Description:

This two part item indicates the restricted conditions that are placed on the permit vehicle based upon the span's load carrying capacity.

Procedure:

Select the letter corresponding to a general restriction (see Item SC03 - Permit Condition) or select the number corresponding to a user specified site specific restriction from Item SC04.

Coding:

A	One Truck on Span at a time	J	Crawl Speed Only (10 mph) Under Bridge
B	Escort Vehicle Required	K	Caution, restricted vertical clearance
C	Truck to Straddle Centerline of Road	L	Truck to straddle two lanes
D	Truck to Travel in Left Lane	M	Call PA Turnpike Commission
E	Truck to Travel in Right Lane	1	Special Condition
F	Truck to Travel in Center Lane	2	Special Condition
G	Truck to Travel on Right Shoulder	3	Special Condition
H	Truck to Travel on Left Shoulder	4	Special Condition
I	Crawl Speed Only (10 mph) Across Bridge		

If special condition 1 thru 4 is selected, then the restriction to be printed on the permit is to be entered in the corresponding field of Item SC04.

SL11 Single Lane Span ID

Other > APRAS Data > APRAS Span > Load Capacity

Description:

This is an optional item used to identify a bridge rating dataset prepared specifically for single lane analysis and the restrictions listed in Item SL10. This item should match Item SS01 except for the fourth digit. In no instance, may a span ID be repeated on a bridge.

See Item SS01 - Span ID for Procedure, Coding, and additional Commentary.

SL12 Restrict Span Id - Restricted Span ID (1)

Other > APRAS Data > APRAS Span > Load Capacity

Description:

This is an optional item used to identify a bridge rating dataset prepared specifically for the restrictions listed in Item SL13. This item should match Item SS01 except for the fourth digit. In no instance, may a Span ID be repeated on a bridge.

See Item SS01 - Span ID for Procedure, Coding, and additional Commentary.

SL13 Restrict Code - Restriction Codes 1, 2, & 3

Other > APRAS Data > APRAS Span > Load Capacity

Description:

This series of three fields indicate the restriction code(s) for the span identified in item SL12.

Procedure:

Select the letter corresponding to a general restriction (see Item SC03 - Permit Condition) or select the number corresponding to a user specified site specific restriction from Item SC04.

Coding:

See Item SL10 for code values.

SL14 Restrict Span Id - Restricted Span ID (2)

Other > APRAS Data > APRAS Span > Load Capacity

Description:

This is an optional item used to identify a bridge rating dataset prepared specifically for the restrictions listed in Item SL15. This item should match Item SS01 except for the fourth digit. In no instance may a span ID be repeated on a bridge.

See Item SS01 - Span ID for Procedure, Coding, and additional Commentary.

SL15 Restrict Code - Restriction Codes 4, 5, 6, & 7

Other > APRAS Data > APRAS Span > Load Capacity

Description:

This series of four fields indicate the restriction code(s) for the span identified in item SL14.

Procedure:

Select the letter corresponding to a general restriction (see Item SC03 - Permit Condition) or select the number corresponding to a user specified site specific restriction from Item SC04.

Coding:

See Item SL10 for code values.

SL16 Notes - Rating Notes

Other > APRAS Data > APRAS Span > Load Capacity

Description:

This item is used to record any notes or comments.

Procedure:

Record any narrative information that is necessary to identify ratings information.

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SC APRAS Span - Clearance (Permit Conditions)

The APRAS Span - Clearance screen is used to enter and display clearance information and permit conditions related to each unique span on a bridge.

The permit conditions are displayed based upon the span highlighted in the Span Clearance section. The system supports a maximum of 7 permit conditions for each span/roadway reference. To be consistent with the current APRAS processing, BMS2 will limit the entry of permit conditions for each span/dataset to 7, with this screen displaying the 7 positions at all times.

By default, the clearance screen will display all the clearance records for a selected Bridge in a tabular form. The records can be sorted for each column by clicking on the desired column heading. Clicking on the column heading a second time will sort the records in descending order.

A new set of clearance information for the roadways on and under the span can be added using the "Create" button. The SR ID field will be populated when the Span ID is entered. If there are multiple SR ID's, the appropriate SR ID can be selected from the dropdown list. Existing records can be deleted by selecting one or more span records and clicking on the "Remove" button. A confirm deletion prompt will be displayed by the system before the records are removed. The "Save" button is used to commit pending changes on the screen, if any, to the database.

SC01 Span ID Suffix

Other > APRAS Data > APRAS Span > Clearance

Description:

This item indicates the unique span ID. The list of Span IDs will match the spans created in the APRAS Span tab. See Item SS01 for description of the ID.

Procedure:

Select the span ID Suffix from the dropdown list.

Coding:

Span ID Suffix from available entries.

SC02 RMS Route

Other > APRAS Data > APRAS Span > Clearance

Description:

This item is comprised of a one digit reference number and a 14 digit RMS Route designation, for the bridge itself or for the route(s) under.

The RMS Route is comprised of four parts. They are: COUNTY, STATE ROUTE, SEGMENT, and OFFSET. See Item 5A01 for a description of each part.

Procedure:

Select the appropriate entry from the dropdown list. The entries in this item are limited to the on and under roadways that are already defined for the structure on the Inventory Roads screen (Screen 5C) and the Agency Roadways screen (Screen 6C).

Do not include a reference line for non-state routes either on or "under" the span. If no state route exists "on" the bridge, add "under" state routes accordingly.

Coding:

County/SR/Segment/Offset associated with the clearance values from available entries.

SC03 Permit Condition

Other > APRAS Data > APRAS Span > Clearance

Description:

This item is used to describe restricted conditions that are to be placed on all permits.

Procedure:

Select the letter corresponding to a general restriction or the number corresponding to a user specified specific condition.

Coding:

A	One Truck on Span at a time	J	Crawl Speed Only (10 mph) Under Bridge
B	Escort Vehicle Required	K	Caution, restricted vertical clearance
C	Truck to Straddle Centerline of Road	L	Truck to straddle two lanes
D	Truck to Travel in Left Lane	M	Call PA Turnpike Commission
E	Truck to Travel in Right Lane	1	Special Condition
F	Truck to Travel in Center Lane	2	Special Condition
G	Truck to Travel on Right Shoulder	3	Special Condition
H	Truck to Travel on Left Shoulder	4	Special Condition
I	Crawl Speed Only (10 mph) Across Bridge		

If special condition 1 thru 4 is selected, then the restriction to be printed on the permit is to be entered in the corresponding field of Item SC04.

SC04 Permit Condition Desc - Permit Condition Description

Other > APRAS Data > APRAS Span > Clearance

Description:

This item is used to record specific permit conditions to be read by the APRAS system. These conditions will be printed on all permits that cross this span.

Procedure:

Record narrative information to be read by the APRAS system and written on the permit. This item must be completed if item SC03 is specified as a special condition.

SC APRAS Span - Clearance (Clearance Details)

The APRAS Span - Clearance, Clearance Details sub-tab is used to enter and display clearance information related to each unique span on a bridge.

By default, the screen will display all the clearance details for a selected span in a tabular form, in ascending/descending order of the Clearance Sequence No. The "Create" button allows the addition of a new clearance detail record. Existing records can be deleted by selecting one or more span records and clicking on the "Remove" button. A confirm deletion prompt will be displayed by the system before the records are removed. The "Save" button is used to commit pending changes on the screen, if any, to the database.

The clearance values are assumed to be positional moving from left to right across the roadway looking segments ahead. Therefore, they must be entered in the proper sequence. An edit will be implemented to ensure that the horizontal distance being specified is greater than the distance for the prior Clearance Sequence Number, except for Clearance Sequence Number 1.

The Span Clearance Detail screen is a subscreen of the Inventory Clearance screen - the clearance details window needs to be closed in order to get access to other windows in the application.

SC05 Non Res Vert Clear - Non-Restricted Vertical Clearance

Other > APRAS Data > APRAS Span > Clearance

Description:

This item is used to record the minimum vertical clearance on or under the structure, within the travel width specified in Items SC07 Travel Width - Left and SC08 Travel Width - Right available to permit vehicles.

Coding:

Enter the minimum vertical clearance available. Measurements may be entered in feet to the nearest hundredth.

If a District wishes to allow APRAS to evaluate a span's vertical clearance without the 0.25' (3") safety tolerance, then mark the checkbox in item SC06. If a District wished to allow APRAS to evaluate a span's vertical clearance without the 0.25' (3") safety tolerance in the old BMS, then this item would have been coded as "RE". If item SC06 is checked, then the bridge opening must then be described in Items SC09 Horizontal Distance and SC10 Vertical Clearance.

Example:

Assume a structure clearance of 14.00'.

A) Evaluated with 0.25 (3") safety tolerance.

<u>Truck Height</u>	<u>Result</u>
> 13.75'	Fail
≤ 13.75'	Pass

B) Evaluated without the 0.25' (3") safety tolerance (Item SC06 is checked).

<u>Truck Height</u>	<u>Result</u>
> 14.00'	Fail
≤ 14.00' and > 13.75'	Manual Review
≤ 13.75'	Pass

SC06 Non Res Review - Non-Restricted Clearance Review Indicator

Other > APRAS Data > APRAS Span > Clearance

Description:

This checkbox field indicates whether or not APRAS is to evaluate a span's vertical clearance without the 0.25' (3") safety tolerance.

Procedure:

Check the box if the APRAS is to evaluate the span's vertical clearance without the 0.25' (3") safety tolerance. Otherwise, leave the box unchecked.

Coding:

Unchecked APRAS is to evaluate the span's vertical clearance with the 0.25' (3") safety tolerance.
 Checked APRAS is to evaluate the span's vertical clearance without the 0.25' (3") safety tolerance.

SC07 Min Travel Width Left - Minimum Travel Width - Left

Other > APRAS Data > APRAS Span > Clearance

Description:

This item is used to record the minimum width of the left pavement available to permit vehicles. Where a bridge obstruction reduces the normal width, paved shoulders capable of sustaining wheel loads may be included.

Procedure:

The left and right directions are determined looking ahead in stations (or increasing segments).

Coding:

Measurements should be taken from the centerline for undivided highway, or from the inside edge of pavement or shoulders for divided highway or one direction traffic, to the outside edge of the paved shoulder looking ahead in stations. Record measurements to the nearest hundredth of a foot.

Enter total minimum width of the pavement including paved shoulders if appropriate capable of sustaining wheel loads for the left roadway.

If there is no usable roadway to the left of a baseline code that value as "0000". This item may not be left blank.

SC08 Min Travel Width Right - Minimum Travel Width - Right

Other > APRAS Data > APRAS Span > Clearance

Description:

This item is used to record the minimum width of the right pavement available to permit vehicles. Where a bridge obstruction reduces the normal width, paved shoulders capable of sustaining wheel loads may be included.

Procedure:

The left and right directions are determined looking ahead in stations (or increasing segments).

Coding:

Measurements should be taken from the centerline for undivided highway, or from the inside edge of pavement or shoulders for divided highway or one direction traffic, to the outside edge of the paved shoulder looking ahead in stations. Record measurements to the nearest hundredth of a foot.

Enter total minimum width of the pavement including paved shoulders if appropriate capable of sustaining wheel loads for the right roadway.

If there is no usable roadway to the right of a baseline code that value as "0000". This item may not be left blank.

SC09 Horizontal Distance

Other > APRAS Data > APRAS Span > Clearance

Description:

This item is used to record the horizontal distance from the centerline or baseline of the roadway to the point of vertical clearance described in Item SC10.

Procedure:

Enter all measurements looking ahead in stations (or increasing segments) from left to right.

For the RMS route on or under the span, enter a horizontal distance from the centerline for undivided highway or baseline of the roadway.

Measurements may be entered to the nearest hundredth of a foot.

Coding:

Horizontal distance from the centerline for undivided highway or baseline of the roadway in feet to the nearest hundredth of a foot. Horizontal Distance at the centerline or baseline is zero. Enter a vertical clearance at each change in elevation of either the roadway or the obstruction over the route.

SC10 Vertical Clearance

Other > APRAS Data > APRAS Span > Clearance

Description:

This item is used to record the actual minimum vertical clearance at the horizontal distance entered in SC09.

Procedure:

Enter all measurements looking ahead in stations (or increasing segments) from left to right.

For the RMS route on or under the span, enter a minimum vertical clearance at each change in elevation of either the roadway or the obstruction over the roadway.

Measurements may be entered to the nearest hundredth of a foot.

If data is entered in SC10, then the entire travel width should be described as entered in SC07 and SC08.

Coding:

Actual minimum vertical clearance corresponding to the horizontal distance (SC09), in feet to the nearest hundredth of a foot.

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IB Inspection - Bearings

The Inspection – Bearings screen is used to view and edit data and information regarding current and past bearing conditions.

IB01 Overall Bearing Condition Rating

Inspection > Joints & Bearings; Form B > Bearings

Description:

This rating is the overall condition rating of all bearings on the bridge. The tables below shall be used to determine this rating.

Procedure:

Select the code from Table IB-1 which best represents the overall condition of the bridge bearings. Refer to Table IB-2 for descriptions of minor, moderate, and major bearing defects. Similar to the condition ratings for deck, superstructure, and substructure, the condition rating selected should best represent all the bearing lines on the bridge and not necessarily be the lowest coded individual line of bearings.

Coding:

Code	Condition	Description
9	EXCELLENT	No defects.
8	VERY GOOD	Insignificant defects.
7	GOOD	Isolated minor defects.
6	SATISFACTORY	Widespread minor or isolated moderate defects.
5	FAIR	Some moderate defects; strength and performance of the component are not affected.
4	POOR	Widespread moderate or isolated major defects; strength or performance of the component is affected.
3	SERIOUS	Some major defects; strength or performance of the component is seriously affected. Condition typically necessitates more frequent monitoring, corrective actions, or load restrictions.
2	CRITICAL	Widespread major defects; component is severely compromised. Condition typically necessitates severe load restrictions and more frequent monitoring, or corrective actions in order to keep the bridge open.
1	IMMINENT FAILURE	Bridge is closed to traffic due to condition. Repair or rehabilitation may return the bridge to service.
0	FAILED	Bridge is closed due to condition and is beyond corrective action. Replacement is required to restore service.
N	NOT APPLICABLE	Bridge does not have bearings.

Table IB-1: Bridge Bearing Condition Rating Code Definitions

Defect	Minor	Moderate	Major
Movement	Minor restriction.	Restricted.	For Major defects, a structural review must be performed to make a determination of strength and performance of the bearing and ultimately if a final finding of major defect is prudent.
Alignment	Lateral or vertical alignment that is inconsistent with temperature conditions but is tolerable.	Approaching limits of lateral or vertical alignment for the bearing.	
Bulging, Splitting, Tearing	Bulging less than 15% of bearing thickness.	Bulging 15% or more of bearing thickness. Splitting or tearing. Bearing's surfaces are not parallel.	
Loss of Bearing Area	Up to 10%.	More than 10%.	
Corrosion	Freckled rust. Corrosion has initiated.	Section loss is evident.	
Connection	Loose fasteners, or pack rust without distortion. Connection is in place and functioning as intended.	Missing bolts, rivets, or fasteners; broken welds; or pack rust with distortion.	

Table IB-2: Bridge Bearing Defect Severity Guide

Do not consider the condition of protective coatings and other protection systems when determining the condition rating code for this item, except to the extent that problems with the protective coating system are indicative of problems with the underlying bearing material.

In cases where the bearing device is not visible, the condition should be assessed based on alignment, grade across the joint, or other indirect indicators of the condition.

IB02 Bearing Key

Inspection > Joints & Bearings; Form B > Bearings

Description:

This display-only item indicates the bearing key number stored for each individual line of bearings on the bridge.

Procedure:

This field is **automatically filled in by the system** when a line of bearings is created in either BMS2 or iForms.

Coding:

A numerical value greater than 0, created in numerical order.

IB03 Record Key

Inspection > Joints & Bearings; Form B > Bearings

Description:

This display-only item indicates the record key number for each specific bearing key. This item differs from IB02 as this record will change when the bearing is replaced at a specific location on the bridge.

Procedure:

This field is **automatically filled in by the system** when a new bearing record is created in either BMS2 or iForms at each individual bearing location.

Coding:

A numerical value starting with 1 and increasing by 1 for each new record created for the specific IB02 – Bearing Key.

IB04 Bearing Type - Type of Bearing Line

Inspection > Joints & Bearings; Form B > Bearings

Description:

This item describes the type of bearing lines on the bridge at a specific location.

Procedure:

Select the type of bearing from the dropdown list being used at the specific location on the bridge.

Note:

When editing an existing bearing location, the previous IB04 Bearing Type will be auto-populated. If changing the Bearing Type is necessary, add additional comments in the IB18 Bearing Comment field about the reason for the change in Bearing Type.

Coding:

NN	Not applicable (for structures such as culverts, etc.)	12	Graphite Asbestos
01	Fixed through dowels	13	Lead
02	Expansion through dowels	14	Grout
03	Steel Plates	15	Asphalt Felt/Tar Paper
04	Lubrite Plates	16	Fabrica
05	Rockers	17	Pot Bearings
06	Rocker Nest	18	Neoprene (plain) and Sliding Steel Plates
07	Rollers	19	Neoprene (laminated) and Sliding Steel Plates
08	Roller-Nest-Open	20	Preformed Fabric and Sliding Steel Plates
09	Roller-Nest-Enclosed	21	Spherical - Bronze or Steel
10	Neoprene (plain)	22	Disk Bearings
11	Neoprene (laminated)	99	Other

IB05 Bearing Location – Location of Bearing Line

Inspection > Joints & Bearings; Form B > Bearings

Description:

This item describes the location of the line of bearings on the structure identified in Item IB04.

Procedure:

Select the location on the structure using the standard language below. The available options for the bearing location must correspond to a substructure unit. If the substructure unit does not exist on the Structure Unit screen under the Inventory Links, it will not appear in the drop down for IB05.

The second part of this field indicates if the bearings at a substructure unit are for the back span, ahead span, or there is a single bearing line.

Note:

When editing an existing bearing location on a new record, the previous IB05 Bearing Location will be auto-populated. If a significant change in location (i.e. P01 to P02) is necessary, create one record using the same location in the IB05 Bearing Location field and add the comment “Relocated” in the IB18 Bearing Comment field. Then add another record, edit the bearing location for this iteration and add additional comments in the IB18 Bearing Comment field indicating the reason for the change in Bearing Location.

Coding:

Refer to the coding descriptions in 5D01 & 5D02 for the types of structure units. The second part of the field indicates the position of the bearings on the substructure unit (i.e. S – Single, A – Ahead, B – Back).

<u>Part 1 (5D01-5D02)</u>	<u>Part 2</u>	<u>Combined</u>	<u>Examples</u>
Abutment – NAB	S	Abutment NAB-S	Single line of bearings at the Far Abutment
Pier – P01	B	Pier P01-B	Bearing line for Span 1 at Pier 1
Pier – P01	A	Pier P01-A	Bearing line for Span 2 at Pier 1
Pier – P02	S	Pier P02-S	Single line of bearings at Pier 2

IB06 Bearing Count

Inspection > Joints & Bearings; Form B > Bearings

Description:

This field indicates the number of bearings within the bearing line at a substructure unit of the same bearing type as described in IB04.

Procedure:

Enter the number of bearings within the bearing line at the specific substructure unit. If multiple bearing types exist within the bearing line, this count should be specific to the bearing type specified within IB04.

Coding:

A numerical value greater than 0.

IB07 Bearing Movement - Bearing Movement Type

Inspection > Joints & Bearings; Form B > Bearings

Description:

This item indicates the movement type for the bearing identified in item IB04.

Procedure:

Select the movement type for the bearing identified in item IB04.

Coding:

E Expansion
F Fixed
G Guided
N Non-Guided

Items IB08 through IB11 can be coded "Yes" if the corrosion, alignment, anchor bolt or loss of bearing reflects any of the conditions provided in the defect table above. The severity of the condition will be described by the numerical value associated with the bearing condition rating.

IB08 Corrosion? - Is Corrosion Present on the Bearings?

Inspection > Joints & Bearings > Bearings Data Detail; Form B > Bearings

Description:

This dropdown field is used to indicate if any of the bearings within the bearing line have corrosion.

Procedure:

Select an option from the dropdown box to indicate if any of the bearings within the bearing line have corrosion. The corrosion should either be a measurable section loss ($> 1/16''$) or impact the bearings ability to move if the bearing line is for expansion.

Coding:

0 - No	No bearings within the bearing line have corrosion
1 - Yes, One	One bearing within the bearing line exhibits corrosion
2 - Yes, Mult	More than one bearing within the bearing line exhibits corrosion

IB09 Alignment Issues? - Are Bearing Alignment Issues Present?

Inspection > Joints & Bearings > Bearings Data Detail; Form B > Bearings

Description:

This dropdown field is used to indicate if any of the bearings within the bearing line have alignment issues.

Procedure:

Select an option from the dropdown box to indicate if any of the bearings within the bearing line have alignment issues. For expansion bearings, measurements should be adjusted for temperature. If the bearing has potential to exceed the maximum allowable movement, mark as "Yes".

Coding:

0 - No	No bearings within the bearing line have alignment issues
1 - Yes, One	One bearing within the bearing line has alignment issues
2 - Yes, Mult	More than one bearing within the bearing line has alignment issues

IB10 Anchor Bolt Issues? – Are Bearing Anchor Bolt Issues Present?

Inspection > Joints & Bearings > Bearings Data Detail; Form B > Bearings

Description:

This dropdown field is used to indicate if any of the bearings within the bearing line have anchor bolt issues.

Procedure:

Select an option from the dropdown box to indicate if any of the bearings within the bearing line have anchor bolt issues. Code “Yes” if one or more of the anchor bolts for a bearing are missing or bent. Code “No” if the nut for the anchor bolt is simply loose or missing.

Coding:

0 - No	No bearings within the bearing line have anchor bolt issues
1 - Yes, One	One bearing within the bearing line has anchor bolt issues
2 - Yes, Mult	More than one bearing within the bearing line has anchor bolt issues

IB11 Loss of Bearing Area?

Inspection > Joints & Bearings > Bearings Data Detail; Form B > Bearings

Description:

This dropdown field is used to indicate if any of the bearings within the bearing line have moderate loss of bearing area.

Procedure:

Select an option from the dropdown box to indicate if any of the bearings within the bearing line have moderate loss of bearing area (10% or more).

Coding:

0 - No	No bearings within the bearing line have moderate loss of bearing area
1 - Yes, One	One bearing within the bearing line has moderate loss of bearing area
2 - Yes, Mult	More than one bearing within the bearing line has moderate loss of bearing area

IB12 Condition Rating – Individual Bearing Condition Rating

Inspection > Joints & Bearings; Form B > Bearings

Description:

This item indicates the condition of the individual line of bearings.

Procedure:

Select the code which describes the overall condition of the individual bearing line. Refer to Tables IB-1 and IB-2 after item IB01 for coding guidance.

Coding:

See Tables IB-1 and IB-2 after item IB01.

IB13 Install Year - Bearing Installation Year

Inspection > Joints & Bearings > Bearings Data Detail; Form B > Bearings

Description:

This item is used to record the year the bearing line was installed.

Procedure:

Enter the year of installation for the line of bearings.

Coding:

Enter the year in YYYY format.

IB14 ECMS ID - Bearing ECMS Project Number

Inspection > Joints & Bearings > Bearings Data Detail; Form B > Bearings

Description:

This item is used to record the ECMS Number associated with the work to repair or replace the bearing.

Procedure:

Enter the ECMS Number associated with the work to repair or replace the bearing, otherwise leave blank.

Coding:

Enter the ECMS number up to six digits.

Example: 101395

IB15 Replacement Reason - Reason Why the Joint was Replaced

Inspection > Joints & Bearings > Bearings Data Detail; Form B > Bearings

Description:

This item is used to record the reason why the bearing line was replaced. This item is required when a subsequent record key is created.

Procedure:

Choose from the dropdown option below that best describes the reason for bearing replacement.

Coding:

- | | | | |
|---|--------------------|---|----------------------------|
| A | Alignment Issues | E | Loss of Bearing Area |
| B | Anchor Bolt Issues | F | Preventative |
| C | Corrosion | G | Superstructure Replacement |
| D | Damaged Bearing | H | Other |

Example:

An example of when to Code F would be rocker bearings that were proactively replaced with pot bearings.

IB16 Replacement Comment - Bearing Replacement Comment

Inspection > Joints & Bearings > Bearings Data Detail; Form B > Bearings

Description:

This item is used to record notes about the bearing replacement in narrative form.

Procedure:

Record any narrative information about the bearing replacement.

IB17 Bearing Comment

Inspection > Joints & Bearings > Bearings Data Detail; Form B > Bearings

Description:

This item is used to record notes about the bearing line in narrative form.

Procedure:

Record any narrative information about the bearing line from the current inspection or maintenance action. This should include if bearings were reset, if bearings were replaced at different times, or any other pertinent information to assist with future decision making and inspections.

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IJ Inspection - Joints

The Inspection – Joints screen is used to view and edit data and information regarding current and past deck joint conditions. This item should only include the number of expansion devices on the bridge. Joints off the bridge (i.e. between the end of the deck/backwall and the approach pavement/slab) are not to be included. Construction joints are not to be included.

IJ01 Overall Joint Condition Rating

Inspection > Joints & Bearings; Form B > Joints

Description:

This rating is the overall condition rating of all joints on the bridge. The tables below shall be used to determine this rating.

Procedure:

Select the code from Table IJ-1 which best represents the overall condition of the bridge joints. Refer to Table IJ-2 for descriptions of minor, moderate, and major joint defects. Similar to the condition ratings for deck, superstructure, and substructure, the condition rating selected should best represent all the joints on the bridge and not necessarily be the lowest coded individual joint.

Coding:

Code	Condition	Description
9	EXCELLENT	No defects.
8	VERY GOOD	Insignificant defects.
7	GOOD	Isolated minor defects.
6	SATISFACTORY	Widespread minor or isolated moderate defects.
5	FAIR	Some moderate defects.
4	POOR	Widespread moderate or isolated major defects.
3	SERIOUS	Some major defects.
2	CRITICAL	Widespread major defects.
1	IMMINENT FAILURE	Joints have failed and are ineffective.
0	FAILED	Joints have failed and present a safety hazard.
N	NOT APPLICABLE	Bridge does not have deck joints.

Table IJ-1: Bridge Joint Condition Rating Code Definitions

Defect	Minor	Moderate	Major
Leakage*	Minimal. Minor dripping through the joint.	Moderate. More than a drip and less than free flow of water.	Free flow of water through the joint.
Seal Adhesion	Adhered for more than 50% of the joint height.	Adhered 50% or less of joint height but still some adhesion.	Complete loss of adhesion.
Seal Cracking	Surface Crack.	Crack that partially penetrates the seal.	Crack that fully penetrates the seal.
Seal Damage	Seal abrasion without punctures.	Punctured, torn, or partially pulled out.	Punctured completely through, pulled out, or missing.
Debris Impaction	Partially filled with hard-packed material, but still allowing free movement.	Completely filled; impacts joint movement.	Completely filled; prevents joint movement.
Adjacent Deck or Header	Edge delamination or spall 1" or less deep or 6" or less in diameter. No exposed rebar. Patched area that is sound.	Spall greater than 1" deep or greater than 6" diameter. Exposed rebar. Delamination or unsound patched area that makes the joint loose.	Spall, delamination, unsound patched area, or loose joint anchor that prevents the joint from functioning as intended.
Metal Deterioration or Damage	Freckled rust. Metal has no cracks or impact damage. Connection may be loose but functioning as intended.	Section loss, missing or broken fasteners, cracking of the metal, or impact damage. Joint still functioning.	Section loss, cracking of the metal, damage, or connection failure that prevents the joint from functioning as intended.

Table IJ-2: Bridge Joint Defect Severity Guide

* The leakage defect applies only to those joints that were designed to have a seal that is currently missing or damaged; not to joints designed as open joints.

Do not consider the condition of protective coatings and other protection systems when determining the condition rating code for this item, except to the extent that problems with the protective coating system are indicative of problems with the underlying joint material.

In cases where the joint is not visible, the condition can be assessed based on other indirect indicators of the condition.

IJ02 Joint Key

Inspection > Joints & Bearings; Form B > Joints

Description:

This display-only item indicates the joint key number stored for each individual joint location.

Procedure:

This field is **automatically filled in by the system** when a joint is created in either BMS2 or iForms.

Coding:

A numerical value greater than 0, created in numerical order.

IJ03 Record Key

Inspection > Joints & Bearings; Form B > Joints

Description:

This display-only item indicates the record key number for each specific joint key. This item differs from IJ02 as this record will change when the joint is replaced at a specific location on the bridge.

Procedure:

This field is **automatically filled in by the system** when a new joint record is created in either BMS2 or iForms at each individual joint location.

Coding:

A numerical value starting with 1 and increasing by 1 for each new record created for the specific IJ02 – Joint Key.

IJ04 Joint Type

Inspection > Joints & Bearings; Form B > Joints

Description:

This item describes the type of deck expansion joint on the bridge at a specific location.

Procedure:

Select the type of joint from the dropdown list being used at the specific location on the bridge.

Note:

When editing an existing joint location, the previous IJ04 Joint Type will be auto-populated. If changing the Joint Type is necessary, add additional comments in the IJ19 Joint Comment field about the reason for the change in Joint Type.

Coding:

A	Open Joint	K	Reinforced Elastomeric/Neoprene Dam
B	Pre-molded Filler	L	Modular
C	Neoprene Sponge	M	Neoprene Strip Seal
D	Plate Dam	N	Armored Preformed Neoprene Compression Dam
E	Plate Dam w/ Galv Gutter	O	Other
F	Plate Dam w/ Neoprene Gutter	P	Asphaltic Plug
G	Tooth Dam	R	Preformed Silicone
H	Tooth Dam w/ Galv Gutter	S	Two Part Silicone
I	Tooth Dam w/ Neoprene Gutter	T	Two Part Silicone w/ Polymer Nosing
J	Preformed Neoprene Compression Seal	Z	Removed

IJ05 Joint Location

Inspection > Joints & Bearings; Form B > Joints

Description:

This item describes the location of the deck expansion joint identified in Item IJ04.

Procedure:

Select the location on the structure using the standard language below. The available options for the joint location must correspond to a structure unit. If the structure unit does not exist on the Structure Unit

screen under the Inventory Links, it will not appear in the drop down for IJ05. For longitudinal joints, record the span the longitudinal joint begins in.

Note:

When editing an existing joint location on a new record, the previous IJ05 Joint Location will be auto-populated. If a significant change in location (i.e. P01 to SP02) is necessary, create one record using the same location in the IJ05 Joint Location field and add the comment "Relocated" in the IJ19 Joint Comment field. Then add another record, edit the joint location for this iteration and add additional comments in the IJ19 Joint Comment field indicating the reason for the change in Joint Location.

Coding:

Refer to the coding descriptions in 5D01 & 5D02 for the structure units.

Examples:

Abutment - NAB	Joint at near abutment
Pier - P01	Joint over Pier 1
Main Span - 2	Pin and hanger system where the joint is 15' away from Pier 1 in Span 2
Main Span - 1	Longitudinal joint runs between dual structures

IJ06 Joint Movement - Joint Movement Class

Inspection > Joints & Bearings; Form B > Joints

Description:

This item describes the movement class of the deck expansion joint identified in Item IJ04.

Procedure:

Select the movement class for the joint.

Coding:

A	Up to 2"	D	Over 8" and up to 12"	U	Unknown
B	Over 2" and up to 4"	E	Over 12"		
C	Over 4" and up to 8"	L	Longitudinal		

IJ07 Joint Manufacturer

Inspection > Joints & Bearings > Joint Data Detail; Form B > Joints

Description:

This item indicates the manufacturer of the deck expansion joint identified in Item IJ04.

Procedure:

Select the manufacturer of the joint from the dropdown list.

Note: Please contact the Bridge Inspection Section to request other manufacturers that are not on the dropdown list so that they can be added to the parameter table.

Coding:

A	Acme	H	Not Applicable	N	LB Foster
B	Watson Bowman	I	Reserved	O	Other
C	Harris	J	Dow Corning	P	Kard
D	Felpro	K	RJ Watson	Q	Pelet
E	DS Brown	L	SSI	R	RP Machinery
F	Royston	M	Amrod	S	Safety Guard
G	Unknown				

IJ08 Joint Length

Inspection > Joints & Bearings > Joint Data Detail; Form B > Joints

Description:

This item is used to record the full length of the joint (including vertical surfaces).

Procedure:

Enter the measured length of the joint to the nearest foot.

Coding:

Length of the joint, to the nearest foot.

Items IJ09 through IJ11 can be checked if the debris impaction, leakage, or damage reflects any of the conditions provided in the defect table above. The severity of the condition will be described by the numerical value associated with the joint condition rating.

IJ09 Debris Impaction? – Does the Joint Exhibit Debris Impaction?

Inspection > Joints & Bearings > Joint Data Detail; Form B > Joints

Description:

This checkbox field is used to indicate if the joint exhibits debris impaction.

Procedure:

Check or uncheck the box to indicate the appropriate code. If Item IJ12 is checked (joint is covered), leave this field unchecked unless there is clear evidence of debris impaction.

Coding:

Unchecked	The joint does not exhibit debris impaction
Checked	The joint exhibits debris impaction as defined in table IJ-2 above

IJ10 Leaking? – Is Joint Leakage Present?

Inspection > Joints & Bearings > Joint Data Detail; Form B > Joints

Description:

This checkbox field is used to indicate if the joint is leaking.

Procedure:

Check or uncheck the box to indicate the appropriate code. The joint does not need to be actively leaking for this box to be checked. Joints with signs of water leakage along superstructure and/or substructure elements that have not been rehabilitated should have this box checked.

Coding:

Unchecked	The joint is not leaking
Checked	The joint is leaking as defined by the defect codes in table IJ-2 above

IJ11 Damage? – Is Joint Damage Present?

Inspection > Joints & Bearings > Joint Data Detail; Form B > Joints

Description:

This checkbox field is used to indicate if the joint is damaged.

Procedure:

Check or uncheck the box to indicate the appropriate code.

Coding:

Unchecked

There is no damage to the joint that impacts the functionality of the joint

Checked

There is damage to the joint that impacts the functionality of the joint as defined by the defect codes in table IJ-2 above

IJ12 Covered? – Is the Joint Covered?

Inspection > Joints & Bearings > Joint Data Detail; Form B > Joints

Description:

This checkbox field is used to indicate if the joint is exposed to traffic and visible or if the joint is hidden (i.e., paved over).

Procedure:

Check or uncheck the box to indicate the appropriate code.

Coding:

Unchecked

The joint is visible

Checked

The joint is covered and is not visible (i.e., the joint is paved over)

IJ13 Condition Rating – Individual Joint Condition Rating

Inspection > Joints & Bearings; Form B > Joints

Description:

This item indicates the condition of the individual joint.

Procedure:

Select the code which best describes the condition of the specific joint. Refer to Tables IJ-1 and IJ-2 after item IJ01 for coding guidance. If IJ12 is checked, refer to previous inspection reports and the condition of adjacent elements to determine the condition rating for the covered joint.

Coding:

Refer to tables IJ-1 and IJ-2 after item IJ01.

IJ14 Extrusion Install Year – Joint Extrusion Install Year

Inspection > Joints & Bearings > Joint Data Detail; Form B > Joints

Description:

This item is used to record the year the joint extrusion was installed. The extrusion is the part of the joint on the edges of the bridge deck. This is generally a piece of metal that the joint seal attaches to. For a plate or tooth dam, this includes the metal portion of the actual joint.

Procedure:

Enter the year of installation for the joint extrusion.

Coding:

Enter the year in YYYY format.

IJ15 Seal Install Year – Joint Seal Install Year

Inspection > Joints & Bearings > Joint Data Detail; Form B > Joints

Description:

This item is used to record the year the joint seal was installed. The seal is the part of the joint that spans the opening. For a plate or tooth dam, this is the gutter beneath the joint.

Procedure:

Enter the year of installation for the joint seal.

Coding:

Enter the year in YYYY format.

IJ16 ECMS No – Joint ECMS Project Number

Inspection > Joints & Bearings > Joint Data Detail; Form B > Joints

Description:

This item is used to record the ECMS Number associated with the work to repair or replace the joint.

Procedure:

Enter the ECMS Number associated with the work to repair or replace the joint, otherwise leave blank.

Coding:

Enter the ECMS number up to six digits.

Example: 101395

IJ17 Replacement Reason – Reason Why the Joint was Replaced

Inspection > Joints & Bearings > Joint Data Detail; Form B > Joints

Description:

This item is used to record the reason why the joint was replaced. This item is required when a subsequent record key is created.

Procedure:

Choose from the dropdown option below that best describes the reason for joint replacement.

Coding:

- | | | | |
|---|---------------|---|--------------------|
| A | Leaking | E | Preventative |
| B | Impact Damage | F | Seal Only Replaced |
| C | Corrosion | G | Other |
| D | Damaged Joint | | |

IJ18 Replacement Comment – Joint Replacement Comment

Inspection > Joints & Bearings > Joint Data Detail; Form B > Joints

Description:

This item is used to record notes about the joint replacement in narrative form.

Procedure:

Record any narrative information about the joint replacement.

IJ19 Joint Comment

Inspection > Joints & Bearings > Joint Data Detail; Form B > Joints

Description:

This item is used to record notes about the joint in narrative form.

Procedure:

Record any narrative information about the joint from the current inspection or maintenance action. This should include if notes on if the metal armoring is painted or galvanized, a reason for the joint removal, or any other pertinent information that will help future decision making.

VB Inventory – Preservation and Rehab

The Inventory – Preservation and Rehab screen is used to enter and display information related to preservation and rehabilitation work done on a bridge. This screen will capture the preservation and rehabilitation history of the structure.

By default, the preservation and rehab screen will display all records for a selected bridge in a tabular form, starting from the most recent preservation or rehab work entered into the system. The records can be sorted for each column by clicking on the desired column heading. Clicking on the column heading a second time will sort the records in descending order. The project detail screen can be opened by selecting the view or edit button to the far right of the project record. A project record can be deleted by selecting the delete button to the right of the view and edit button.

New preservation and rehab projects can be added using the "Create" button (green button next to Action heading). **Preservation and rehab records on this screen are to be created after the let date for a project has passed.** This will ensure the basic information be transferred over to BMS2 from ECMS is from a valid project planned for construction. Some of the basic information that is being transferred, such as Item VB06 – Total Bid Cost is only available after the let date. As part of the nightly batch between the two systems, ECMS projects with a valid BRKEY will update BMS2. This will ensure updated information is stored on the Preservation and Rehab screen.

The user may enter preservation and rehab projects that have already been completed in the past to further enhance the historical data for a structure. If the ECMS Number of the previous project is known, it may be entered in Item VB01 and will fill in the items automated based off the ECMS Number if the "Load ECMS" button is clicked or the screen is saved. If the ECMS Number is not known, the user may still enter information on the historical project but is only required to enter Items VB02 and VB03.

In addition to the specific project work type/cost information that is recorded on this page, certain condition ratings and inventory items can be recorded for before and after work done on a bridge. Below lists the procedures used for populating the condition rating and inventory information for these sections.

CONDITION RATING ITEMS

The condition rating fields on this page consist of Items VB22, VB23, VB50, VB60, VB71, VB72, VB73, and VB91. These items are used to capture the improvement in condition ratings as a result of the work done for this project record. To populate the "before" and "after" condition ratings, the user must select the appropriate inspection records in Items VB20 and VB21 and click the "Populate" button. The inspection selected in Item VB20 populates the "before" condition ratings from that inspection record and the inspection selected in Item VB21 populates the "after" condition ratings from that inspection record. The "before" condition ratings will only be populated if an inspection is selected in Item VB20. The same is true for the "after" condition ratings and Item VB21.

INVENTORY ITEMS

The inventory fields on this page linked to other areas of BMS2 consist of Items VB24-VB32 and VB74-VB77. This screen gives the ability to capture a history of these inventory items as they change with construction projects. The "before" codes for these inventory items will be populated when the project record is created on this screen. These "before" fields will remain editable for the user after project creation for when a historical project is being entered and the "before" fields need changed to the correct coding they were before that historical project. The "after" codes for these inventory items are editable fields that will need updated by the user as per changes from the project plans. When the "after" fields have been filled out, the user is given the option to click the Export button, located below Items VB32 and VB77 (both buttons have the exact same functionality), which will export those inventory items to their respective linked fields on other screens in BMS2. The Export button will export all non-condition fields to the corresponding fields on the Agency Bridge screen, regardless if a value was entered or if the field was left blank as some codings of a blank are valid.

VB01 ECMS Number

Inventory > Preservation and Rehab

Description:

This item is used to record the ECMS Project Number that is associated with the work done on the bridge.

Procedure:

This item is recorded to identify the project in ECMS and link it to this screen. **Enter the ECMS Number for a project only after it has been let. After entering the ECMS Number, click "Load ECMS" or save the screen.** If the work was completed without an ECMS Number (Department Maintenance Forces, local bridge contract), leave this field blank. A message will display if an invalid ECMS number is entered in this item.

If an ECMS number is entered, the following fields will be populated on the screen: VB04, VB05, VB06, VB08, VB12, VB15, and VB16.

Coding:

Enter a valid ECMS Number associated with the project and click "Load ECMS" or save the screen. The ECMS Number will be coded as a number up to 6 digits. If work was completed without an ECMS Number, leave **blank**.

VB02 Work Scope (TAMP) 🚧

Inventory > Preservation and Rehab

Description:

This item is used to record the TAMP (Transportation Asset Management Plan) scope of work completed on the bridge.

Procedure:

This item is recorded to identify the TAMP scope of work. The information is used by PennDOT when submitting information to FHWA regarding projects completed within the Commonwealth. **In the future this item will be automatically filled in by the system from ECMS if a valid ECMS number is entered in Item VB01.** For now, this item is selected manually. Below are the coding options that can be populated. Only one can be selected for a project. Additional information on the differences between the five coding options can be found below and on PennDOT's Asset Management website.

Coding:

- 1 Initial Construction/Capacity Added
- 2 Reconstruction
- 3 Rehabilitation
- 4 Preservation
- 5 Maintenance

Examples:

For widening projects that add lane(s), code "1 – Initial Construction/Capacity Added"

For bridges reconstructed in the same location, code "2 – Reconstruction"

For superstructure replacement projects, code "3 – Rehabilitation"

For projects that upgrade structure to current standards, code "3 – Rehabilitation"

VB03 Work Type (BAMS)

Inventory > Preservation and Rehab

Description:

This item is used to record the BAMS (Bridge Asset Management Section) type of work completed on the bridge.

Procedure:

This item is a multi-select checkbox field used to capture every type of work done on the bridge for the project record.

Coding:

- | | | | |
|---|-----------------------------------|----|-------------------------------------|
| 1 | Preservation - Bituminous Overlay | 10 | Rehab - Substructure |
| 2 | Preservation - Latex Overlay | 11 | Rehab - Culvert |
| 3 | Preservation - Epoxy | 12 | Replacement - Deck Only |
| 4 | Preservation - PPC | 13 | Replacement - Deck & Superstructure |
| 5 | Preservation - Joints | 14 | Replacement - Bridge |
| 6 | Preservation - Paint | 15 | Replacement - Culvert |
| 7 | Preservation - Bearings | 16 | Maintenance |
| 8 | Preservation - Culvert | 17 | New Construction |
| 9 | Rehab - Superstructure | | |

VB04 Let Date

Inventory > Preservation and Rehab

Description:

This item is used to record the date the project was let for the bridge.

Procedure:

This item is **automatically filled in by the system** from ECMS if a valid ECMS number is entered in Item VB01. The location of this field in ECMS is as follows: 'Setup' Section > Milestones > Let Date > 'Actual Date' Column. If a project is entered without a known ECMS number, this item will no longer be automated and can be manually entered by the user.

Coding:

Date with formatting mm/dd/yyyy.

VB05 Work Completion Date

Inventory > Preservation and Rehab

Description:

This item is used to record the date that the physical work was completed on the bridge.

Procedure:

This item is **automatically filled in by the system** from ECMS if a valid ECMS number is entered in Item VB01. The location of this field in ECMS is as follows: 'Setup' Section > Milestones > Physical Work Complete > 'Actual Date' Column. If a project is entered without a known ECMS number, this item will no longer be automated and can be manually entered by the user.

Coding:

Date with formatting mm/dd/yyyy.

VB06 Total Bid Cost

Inventory > Preservation and Rehab

Description:

This item is used to record the total bid cost to perform the work on the bridge.

Procedure:

This item is automatically filled in by the system from ECMS if a valid ECMS number is entered in Item VB01. The location of this field in ECMS is as follows: ECMS Landing Page > Financial Information Section > Original Contract. If a project is entered without a known ECMS number, this item will no longer be automated and can be manually entered by the user.

Coding:

This item is coded in dollar amount to the cent.

VB07 Total Structure Cost @ Let

Inventory > Preservation and Rehab

Description:

This item is used to record the structural portion of the BID cost associated with the project for the individual structure.

Procedure:

This item is to be entered by the user based off costs in the original contract (BID cost) for the individual structure. This item excludes costs such as traffic control measures, roadway improvements, etc.

Coding:

This item is coded in dollar amount to the cent.

VB08 Total Amount Tendered Cost

Inventory > Preservation and Rehab

Description:

This item is used to record the total final costs associated with the project. This includes all adjustments and work orders that may have happened during the construction phase of the project and portrays the final total amount spent.

Procedure:

This item is automatically filled in by the system from ECMS if a valid ECMS number is entered in Item VB01. The location of this field in ECMS is as follows: ECMS Landing Page > Financial Information Section > Amount Tendered. If a project is entered without a known ECMS number, this item will no longer be automated and can be manually entered by the user.

Coding:

This item is coded in dollar amount to the cent.

VB09 Total Structure Cost @ Final

Inventory > Preservation and Rehab

Description:

This item is used to record the structural portion of the FINAL cost associated with the project for the individual structure.

Procedure:

This item is to be entered by the user based off costs for the final project (amount tendered cost) for the individual structure. This item excludes costs such as traffic control measures, roadway improvements, etc.

Coding:

This item is coded in dollar amount to the cent.

VB10 MPMS Number

Inventory > Preservation and Rehab > Preservation and Rehab Detail

Description:

This item is used to record the MPMS Project Number that is associated with the work done on the bridge.

Procedure:

Enter the MPMS number for the specific project. This number will generally be the same as the ECMS number.

Coding:

The MPMS Number will be coded as a number up to 6 digits.

VB11 S-Drawing Number

Inventory > Preservation and Rehab > Preservation and Rehab Detail

Description:

This item is used to record the number of the S-Drawings (Design Drawings) for the work done on the bridge.

Procedure:

This number can be found on the Design Drawings for the work done on the bridge. This number can also be found in ECMS in the following location: 'Setup' Section > Structures > 'S-Number' Column.

Coding:

The S-Drawing will be in formatting S-XXXXX or L-XXXXX.

Examples:

S-12345

L-87589

VB12 Work Status

Inventory > Preservation and Rehab

Description:

This item is used to record the current status of the work being done on the bridge.

Procedure:

This item is automatically filled in by the system from ECMS if a valid ECMS number is entered in Item VB01. The location of this field in ECMS is in the top right corner of the landing page. If a historical project is entered without a known ECMS number, this item will no longer be automated and can be manually entered by the user. Historical projects should all be entered as "Final" if entered without an ECMS number.

Coding:

01 Design	30 NTP Issued	95 Local Administered
02 Review Bid Package	40 Construction	96 Not Constructed
03 Advertised	50 Post-Construction	97 Pending Redesign
04 Pre-Award	55 NFQ Submitted	98 Pending Bid Opening
10 Award	60 Final	99 Pend EBS File Create
20 PreConst (Post Award)		

VB13 Project Narrative

Inventory > Preservation and Rehab > Preservation and Rehab Detail

Description:

This item is used to record details about the work done on the bridge.

Procedure:

Enter any details about the work being done. This can be used to specify exactly what kind of work is being done or to clarify information for the user.

VB14 Staged Construction?

Inventory > Preservation and Rehab > Preservation and Rehab Detail

Description:

This item is used to record whether the work utilized staged construction.

Procedure:

Select the appropriate code from the dropdown list.

Coding:

Yes	Yes, the work utilized staged construction
No	No, the work did not utilize staged construction

VB15 Primary Contractor?

Inventory > Preservation and Rehab > Preservation and Rehab Detail

Description:

This item is used to record the Primary Contractor performing the work done on the bridge.

Procedure:

This item is automatically filled in by the system from ECMS if a valid ECMS number is entered in Item VB01. The location of this field in ECMS is as follows: 'Setup' Section > Team > 'Business Partners' Table > 'Contractor Team' Section. If a project is entered without a known ECMS number, this item will no longer be automated and the checkbox can be manually selected from the list of contractors by the user.

Coding:

Checked Contractor identified under VB16 is the prime contractor for the project.
 Unchecked Contractor identified under VB16 is NOT the prime contractor for the project

VB16 Contractor

Inventory > Preservation and Rehab > Preservation and Rehab Detail

Description:

This item is used to record any contractors performing the work done on the bridge.

Procedure:

This item is automatically filled in by the system from ECMS if a valid ECMS number is entered in Item VB01. The location of this field in ECMS is as follows: 'Setup' Section > Team > 'Business Partners' Table > 'Contractor Team' Section. If a historical project is entered without a known ECMS number, this item will no longer be automated and can be manually entered by the user.

Coding:

The name of the contractor performing the work on the project.

VB16a Contractor Role

Inventory > Preservation and Rehab > Preservation and Rehab Detail

Description:

This item is used to record the contractor's role in the work done on the bridge.

Procedure:

In narrative form, enter the contractor's role in the work being done.

VB17 through VB19 (Not Used – Reserved for Future Use)

VB20 Inspection Record Prior to Project

Inventory > Preservation and Rehab > Preservation and Rehab Detail

Description:

This item is used to record the last inspection record prior to the work being completed on the bridge.

Procedure:

Select the inspection record prior to work being completed on the bridge and click the "Populate" button. This inspection record is used to populate the "before" condition values located on this screen. The "before" values for Items VB22, VB23, VB50, VB60, VB71, VB72, VB73, and VB91 will only be populated when the user selects the inspection record in this field. If the date is left blank and the "Populate" button is clicked, no fields will be updated.

Coding:

A dropdown list of inspection dates from the inspection dates recorded on the Ratings & Schedule screen.

VB21 Inspection Record After Project

Inventory > Preservation and Rehab > Preservation and Rehab Detail

Description:

This item is used to record the first inspection record after the work is completed on the bridge.

Procedure:

Select the inspection record after the work is completed on the bridge and click the "Populate" button. This inspection record is used to populate the "after" condition values located on this screen. The "after" values for Items VB22, VB23, VB50, VB60, VB71, VB72, VB73, and VB91 will only be populated when the user selects the inspection record in this field. If the date is left blank and the "Populate" button is clicked, no fields will be updated.

Coding:

A dropdown list of inspection dates from the inspection dates recorded on the Ratings & Schedule screen.

VB22 Deck Condition Rating Before and After

Inventory > Preservation and Rehab > Preservation and Rehab Detail

Description:

This two-part item is used to record the Deck Condition Rating before and after the work is complete.

Procedure:

The "before" field is automatically filled in from Item 1A01 from the inspection record selected in Item VB20. The "before" field will be blank until an inspection record is selected in Item VB20. The "after" field is automatically filled in from Item 1A01 from the inspection record selected in Item VB21. The "after" field will be blank until an inspection is selected in Item VB21.

Coding:

Refer to **RATING CODES** located at the beginning of Section 1A.

VB23 Wearing Surface Condition Rating Before and After

Inventory > Preservation and Rehab > Preservation and Rehab Detail

Description:

This two-part item is used to record the Wearing Surface Condition Rating before and after the work is complete.

Procedure:

The "before" field is automatically filled in from Item 6B40 from the inspection record selected in Item VB20. The "before" field will be blank until an inspection record is selected in Item VB20. The "after" field is automatically filled in from Item 6B40 from the inspection record selected in Item VB21. The "after" field will be blank until an inspection is selected in Item VB21.

Coding:

Refer to RATING CODES located before item 6B38.

VB24a Deck Surface Type Before and After (Main Span)

Inventory > Preservation and Rehab

Description:

This two-part item is used to record the type of wearing surface for the main spans on the bridge before and after work is complete.

Procedure:

The "before" wearing surface type is automatically filled in from Item 5B02 when the project record is created. This field will remain editable after automation for entering historical coding. Select the "after" wearing surface for the main spans from the dropdown list for after the work is complete. Clicking the Export button below the table will automatically update Item 5B02 with the "after" wearing surface.

Coding:

See coding for Item 5B02.

VB24b Deck Surface Type Before and After (Approach Span)

Inventory > Preservation and Rehab

Description:

This two-part item is used to record the type of wearing surface for the approach spans on the bridge before and after work is complete.

Procedure:

The "before" wearing surface type is automatically filled in from Item 6A30 when the project record is created. This field will remain editable after automation for entering historical coding. Select the "after" wearing surface for the approach spans from the dropdown list for after the work is complete. Clicking the Export button below the table will automatically update Item 6A30 with the "after" wearing surface.

Coding:

See coding for Item 6A30.

VB25a Deck Membrane Type Before and After (Main Span)

Inventory > Preservation and Rehab > Preservation and Rehab Detail

Description:

This two-part item is used to record the type of membrane waterproofing on the main spans of the bridge before and after the work is complete.

Procedure:

The “before” membrane type is automatically filled in from Item 5B03 when the project record is created. The field will remain editable after automation for entering historical coding. Select the “after” type of membrane from the dropdown list for after the work is complete. Clicking the Export button below the table will automatically update Item 5B03 with the “after” membrane type.

Coding:

See coding for Item 5B03.

VB25b Deck Membrane Type Before and After (Approach Span)

Inventory > Preservation and Rehab > Preservation and Rehab Detail

Description:

This two-part item is used to record the type of membrane waterproofing on the approach spans of the bridge before and after the work is complete.

Procedure:

The “before” membrane type is automatically filled in from Item 6A31 when the project record is created. The field will remain editable after automation for entering historical coding. Select the “after” type of membrane from the dropdown list for after the work is complete. Clicking the Export button below the table will automatically update Item 6A31 with the “after” membrane type.

Coding:

See coding for Item 6A31.

VB26a Deck Protection Type Before and After (Main Span)

Inventory > Preservation and Rehab > Preservation and Rehab Detail

Description:

This two-part item is used to record the type of deck corrosion protection on the main spans on the bridge before and after the work is complete.

Procedure:

The “before” protection type is automatically filled in from Item 5B04 when the project record is created. The field will remain editable after automation for entering historical coding. Select the “after” type of deck protection from the dropdown list for after the work is complete. Clicking the Export button below the table will automatically update Item 5B04 with the “after” protection type.

Coding:

See coding for Item 5B04.

VB26b Deck Protection Type Before and After (Approach Span)

Inventory > Preservation and Rehab > Preservation and Rehab Detail

Description:

This two-part item is used to record the type of deck corrosion protection on the approach spans on the bridge before and after the work is complete.

Procedure:

The "before" protection type is automatically filled in from Item 6A32 when the project record is created. The field will remain editable after automation for entering historical coding. Select the "after" type of deck protection from the dropdown list for after the work is complete. Clicking the Export button below the table will automatically update Item 6A32 with the "after" protection type.

Coding:

See coding for Item 6A32.

VB27a Wearing Surface Thickness Before and After (Main Span)

Inventory > Preservation and Rehab > Preservation and Rehab Detail

Description:

This two-part item is used to record the average thickness of the wearing surface on the main span of the bridge before and after the work is complete.

Procedure:

The "before" main span wearing surface thickness is automatically filled in from Item 6A33 when the project record is created. The field will remain editable after automation for entering historical coding. Enter the "after" average thickness of the wearing surface for the main span to the nearest tenth of an inch for after the work is complete. Clicking the Export button below the table will automatically update Item 6A33 with the "after" main span wearing surface thickness.

Coding:

Enter the average thickness of the wearing surface to the nearest tenth of an inch, if known. Code "0" if thickness is not applicable. Code "0.5" for concrete integral wearing surface cast with the deck.

VB27b Wearing Surface Thickness Before and After (Approach Span)

Inventory > Preservation and Rehab > Preservation and Rehab Detail

Description:

This two-part item is used to record the average thickness of the wearing surface on the approach span of the bridge before and after the work is complete.

Procedure:

The "before" approach span wearing surface thickness is automatically filled in from Item 6A33 when the project record is created. The field will remain editable after automation for entering historical coding. Enter the "after" average thickness of the wearing surface for the approach span to the nearest tenth of an inch for after the work is complete. Clicking the Export button below the table will automatically update Item 6A33 with the "after" approach span wearing surface thickness.

Coding:

Enter the average thickness of the wearing surface to the nearest tenth of an inch, if known. Code "0" if thickness is not applicable. Code "0.5" for concrete integral wearing surface cast with the deck.

VB28 Deck Protection Year Before and After

Inventory > Preservation and Rehab > Preservation and Rehab Detail

Description:

This two-part item is used to record the year the deck protective system was installed before and after the work is complete.

Procedure:

The "before" protection year is automatically filled in from Item 6A36 when the project record is created. The field will remain editable after automation for entering historical coding. Enter the "after" protection year for after the work is complete. Clicking the Export button below the table will automatically update Item 6A36 with the "after" protection year.

Coding:

4-digit year in which the protective system was installed. Leave blank if not applicable.

VB29 Deck Protection System Note Before and After

Inventory > Preservation and Rehab > Preservation and Rehab Detail

Description:

This two-part item is used to record descriptive information about the deck protective systems before and after the work is complete.

Procedure:

The "before" protection system note is automatically filled in from Item 6A37 when the project record is created. The field will remain editable after automation for entering historical coding. For "after", enter available information about the deck protective systems for after the work is complete. Clicking the Export button below the table will automatically update Item 6A37 with the "after" protection system note.

VB30 Bridge Deck Type Before and After

Inventory > Preservation and Rehab > Preservation and Rehab Detail

Description:

This two-part item is used to record the type of structural deck that is supported by the underlying load carrying members of the superstructure before and after the work is complete.

Procedure:

The "before" deck type is automatically filled in from Item 6A38 when the project record is created. The field will remain editable after automation for entering historical coding. Select the "after" bridge deck type listed below for after the work is complete. Clicking the Export button below the table will automatically update Item 6A38 with the "after" bridge deck type.

Coding:

See coding for Item 6A38.

VB31 Deck Form Type Before and After

Inventory > Preservation and Rehab > Preservation and Rehab Detail

Description:

This two-part item is used to record the type of deck form used on the bridge before and after the work is complete.

Procedure:

The “before” deck form type is automatically filled in from Item 6A40 when the project record is created. The field will remain editable after automation for entering historical coding. Select the “after” type of deck form used on the bridge for after the work is complete. Clicking the Export button below the table will automatically update Item 6A40 with the “after” deck form type.

Coding:

See coding for Item 6A40.

VB32 Deck Rebar Type Before and After

Inventory > Preservation and Rehab > Preservation and Rehab Detail

Description:

This two-part item is used to record the type of protective system used on the reinforcement bars in the concrete bridge deck before and after work is complete.

Procedure:

The “before” deck rebar type is automatically filled in from Item 6A42 when the project record is created. The field will remain editable after automation for entering historical coding. Select the “after” type of deck rebar used in the bridge deck for after the work is complete. Clicking the Export button below the table will automatically update Item 6A42 with the “after” deck rebar type.

Coding:

See coding for Item 6A42.

VB33 Deck Rehab Area

Inventory > Preservation and Rehab > Preservation and Rehab Detail

Description:

This item is used to record the deck rehab area in square feet.

Procedure:

This item records the area of the deck rehab work. If the entire deck is being rehabbed, enter the deck area from Item 5B19. If only a portion of the deck is being rehabbed, enter that portion of the area in square feet.

Coding:

The deck rehab area to the nearest square foot.

VB34 Deck Overlay Area

Inventory > Preservation and Rehab > Preservation and Rehab Detail

Description:

This item is used to record the deck overlay area in square feet.

Procedure:

This item is used to record the area of the new deck overlay placed on the bridge for this project.

Coding:

Enter the deck overlay area to the nearest square foot.

VB35 Deck Overlay Cost

Inventory > Preservation and Rehab > Preservation and Rehab Detail

Description:

This item is used to record the cost of the deck overlay (from Item VB34) in dollars. This includes costs for material and installation.

Procedure:

This item is used to record the cost of the new deck overlay placed on the bridge for this project.

Coding:

Enter the deck overlay cost in dollars to the cent.

VB36 Deck Overlay Cost per SF

Inventory > Preservation and Rehab > Preservation and Rehab Detail

Description:

This item is only filled in if the Items VB34 and VB35 are filled out. This item is used to record the cost of the deck overlay per square foot.

Procedure:

This item is automatically filled in from Items VB34 and VB35.

Coding:

The deck overlay cost per square foot.

VB37 Duration to Install Overlay

Inventory > Preservation and Rehab > Preservation and Rehab Detail

Description:

This item is only available to fill in if the project includes deck work on the bridge (Item VB03 = 1, 2, 3, 11, 12). This item is used to record, from start to finish, the duration of the overlay work.

Procedure:

This item is used to record the duration of the new deck overlay work on the bridge for this project.

Coding:

Enter the duration in days.

VB38 Deck Repair Area

Inventory > Preservation and Rehab > Preservation and Rehab Detail

Description:

This item will record the area of deck repairs done on the bridge as defined in Pub 219M (Bridge Construction Standards), Sheet 1 of BC-783M.

Procedure:

Record the area of Type 1, Type 2, or Type 3 deck repairs.

Coding:

Enter the area of deck repairs in square feet.

VB39 Deck Repair Cost

Inventory > Preservation and Rehab > Preservation and Rehab Detail

Description:

This item is used to record the total cost of the deck repairs (from Item VB38) in dollars. This includes costs for material and installation.

Procedure:

This item is used to record the cost of the new deck repairs on the bridge for this project.

Coding:

Enter the deck repair cost in dollars to the cent.

VB40 Deck Repair Cost per SF

Inventory > Preservation and Rehab > Preservation and Rehab Detail

Description:

This item is only filled in if the project includes deck work on the bridge and Items VB38 and VB39 are filled out. This item is used to record the cost of the deck repair per square foot.

Procedure:

This item is automatically filled in from Items VB38 and VB39.

Coding:

The deck repair cost per square foot.

VB41 Hydro-Demolition – Was Hydro-Demolition Used?

Inventory > Preservation and Rehab > Preservation and Rehab Detail

Description:

This item is used to record if hydro-demolition was used for the work on the deck.

Procedure:

Check this box if hydro-demolition was used for work on the deck.

Coding:

Checked	Yes, hydro-demolition was used
Unchecked	No, hydro-demolition was not used

VB42 through VB49 (Not Used – Reserved for Future Use)

VB50 Overall Joint Condition Rating Before and After

Inventory > Preservation and Rehab > Preservation and Rehab Detail

Description:

This two-part item is used to record the Overall Joint Condition Rating before and after the work is complete.

Procedure:

The “before” field is automatically filled in from Item IJ01 from the inspection record selected in Item VB20. The “before” field will be blank until an inspection is selected in Item VB20. The “after” field is automatically filled in from Item IJ01 from the inspection record selected in Item VB21. The “after” field will be blank until an inspection is selected in Item VB21.

Coding:

Refer to Item IJ01 for condition coding options.

VB51 Joint Work Record Key

Inventory > Preservation and Rehab > Preservation and Rehab Detail

Description:

This item records the Joint Work Record Key for each type of joint work done on the bridge. (Enter as many records as needed, should be one per joint type/work scope, not one per location).

Procedure:

Joint Work Record Keys are added by selecting the "Create" button (green button to the far right of the Joints heading). Each additional Record Key is automatically filled in by the system and will be in numerical order.

Coding:

The Record Key for each Joint Work Type.

VB52 Joint Scope of Work

Inventory > Preservation and Rehab > Preservation and Rehab Detail

Description:

This item is used to record the scope of work for joints on the bridge (Enter as many records as needed, should be one per joint type/work scope, not one per location).

Procedure:

Select the appropriate scope of work from the dropdown list.

Coding:

- 1 Rehab
- 2 Replace

VB53 Joint Type

Inventory > Preservation and Rehab > Preservation and Rehab Detail

Description:

This item is used to record the type of deck expansion joint that was rehabilitated or replaced (Enter as many records as needed, should be one per joint type/work scope, not one per location). For replacement work scope, enter the joint type of the new joint being installed.

Procedure:

Select the type of joint from the dropdown list.

Coding:

See coding for Item IJ04.

VB54 Joint Movement Class

Inventory > Preservation and Rehab > Preservation and Rehab Detail

Description:

This item is used to record the movement class for the joint type identified in Item VB53 (Enter as many records as needed, should be one per joint type/work scope, not one per location).

Procedure:

Select the movement class for the joint from the dropdown list.

Coding:

See coding for Item IJ06.

VB55 Length of Joint

Inventory > Preservation and Rehab > Preservation and Rehab Detail

Description:

This item is used to record the length of the joint work (including vertical surfaces) for a joint work type record.

Procedure:

Enter the length of the joint work in linear feet.

Coding:

Enter the length to the nearest foot in linear feet.

VB56 Cost - Joint Work Cost

Inventory > Preservation and Rehab > Preservation and Rehab Detail

Description:

This item is used to record the costs to perform the joint work for a joint work type record.

Procedure:

The cost shall include all the expenses to perform the joint rehab/replacement.

Coding:

Enter the joint work cost in dollars to the cent.

VB57 Cost per LF - Joint Work Cost per LF

Inventory > Preservation and Rehab > Preservation and Rehab Detail

Description:

This item will only be filled in if the project includes joint work on the bridge and Items VB55 and VB56 are filled out. This item is used to record the cost per linear foot of the joint work for a joint work type record.

Procedure:

This item is automatically filled in from Items VB55 and VB56 if both values are filled in.

Coding:

The joint work cost per linear foot.

VB58 (Not Used – Reserved for Future Use)

VB59 (Not Used – Reserved for Future Use)

VB60 Overall Bearing Condition Rating Before and After

Inventory > Preservation and Rehab > Preservation and Rehab Detail

Description:

This two-part item is used to record the Overall Bearing Condition Rating before and after the work is complete.

Procedure:

The "before" field is automatically filled in from Item IB01 from the inspection record selected in Item VB20. The "before" field will be blank until an inspection is selected in Item VB20. The "after" field is automatically filled in from Item IB01 from the inspection record selected in Item VB21. The "after" field will be blank until an inspection is selected in Item VB21.

Coding:

Refer to Item IB01 for condition coding options.

VB61 Bearing Work Record Key

Inventory > Preservation and Rehab > Preservation and Rehab Detail

Description:

This item records the Bearing Work Record Key for each type of bearing work done on the bridge. (Enter as many records as needed, should be one per bearing type/work scope, not one per location).

Procedure:

Bearing Work Record Keys are added by selecting the "Create" button (green button to the far right of the Bearings heading). Each additional Record Key is automatically filled in by the system and will be in numerical order.

Coding:

The Record Key for each Bearing Work Type.

VB62 Bearing Scope of Work

Inventory > Preservation and Rehab > Preservation and Rehab Detail

Description:

This item is only available to fill in if the project includes bearing work on the bridge (Item VB03 = 6, 12). This item is used to record the scope of work for bearings on the bridge (Enter as many records as needed, should be one per bearing type/work scope, not one per location).

Procedure:

Select the appropriate scope of work from the dropdown list.

Coding:

- 1 Rehab
- 2 Replace

VB63 Bearing Type

Inventory > Preservation and Rehab > Preservation and Rehab Detail

Description:

This item is used to record the type of bearing that was rehabilitated or replaced (Enter as many records as needed, should be one per bearing type/work scope, not one per location). For replacement work scope, enter the bearing type of the new bearing being installed.

Procedure:

Select the type of bearing from the dropdown list.

Coding:

See coding for Item IB04.

VB64 Bearing Movement Type

Inventory > Preservation and Rehab > Preservation and Rehab Detail

Description:

This item is used to record the movement type for the bearing type identified in Item VB63 (Enter as many records as needed, should be one per bearing type/work scope, not one per location).

Procedure:

Select the movement type for the bearing from the dropdown list.

Coding:

See coding for Item IB07.

VB65 Bearing Count on Bridge

Inventory > Preservation and Rehab > Preservation and Rehab Detail

Description:

This item is used to record the count of bearings being worked on for a bearing work type record.

Procedure:

Enter the count of bearings being worked on.

Coding:

Enter the count as an integer.

VB66 Cost - Bearing Work Cost

Inventory > Preservation and Rehab > Preservation and Rehab Detail

Description:

This item is used to record the costs to perform the bearing work for a bearing work type record.

Procedure:

The cost shall include all the expenses to perform the bearing rehab/replacement.

Coding:

Enter the bearing work cost in dollars to the cent.

VB67 Cost per Bearing

Inventory > Preservation and Rehab > Preservation and Rehab Detail

Description:

This item will only be filled in if the project includes bearing work on the bridge and Items VB65 and VB66 are filled out. This item is used to record the cost per bearing of the work for a bearing work type record.

Procedure:

This item is automatically filled in from Items VB65 and VB66.

Coding:

The work cost per bearing.

VB68 (Not Used - Reserved for Future Use)

VB69 (Not Used - Reserved for Future Use)

VB70 Superstructure Work Type 🚧

Inventory > Preservation and Rehab > Preservation and Rehab Detail

Description:

This item is used to record the type of superstructure/culvert/paint work being done.

Procedure:

This item is a multi-select checkbox field used to capture every type of superstructure/culvert/paint work done for the current project. Select the most appropriate coding from the options below.

Coding:

- | | | | |
|---|-----------------------|----|--------------------------------|
| 1 | Steel Beam Repair | 8 | Timber Beam Replace |
| 2 | Steel Beam Replace | 9 | Truss Member Repair |
| 3 | Concrete Beam Repair | 10 | Truss Member Replace |
| 4 | Concrete Beam Replace | 11 | Culvert Repair |
| 5 | Masonry Repair | 12 | Paint - Partial Superstructure |
| 6 | Masonry Replace | 13 | Paint - Full Superstructure |
| 7 | Timber Beam Repair | 14 | Other |

VB71 Superstructure Condition Rating Before and After

Inventory > Preservation and Rehab > Preservation and Rehab Detail

Description:

This two-part item is used to record the Superstructure Condition Rating before and after the work is complete.

Procedure:

The "before" field is automatically filled in from Item 1A04 from the inspection record selected in Item VB20. The "before" field will be blank until an inspection is selected in Item VB20. The "after" field is automatically filled in from Item 1A04 from the inspection record selected in Item VB21. The "after" field will be blank until an inspection is selected in Item VB21.

Coding:

Refer to RATING CODES located at the beginning of Section 1A.

VB72 Culvert Condition Rating Before and After

Inventory > Preservation and Rehab > Preservation and Rehab Detail

Description:

This two-part item is used to record the Culvert Condition Rating before and after the work is complete.

Procedure:

The "before" field is automatically filled in from Item 1A03 from the inspection record selected in Item VB20. The "before" field will be blank until an inspection is selected in Item VB20. The "after" field is automatically filled in from Item 1A03 from the inspection record selected in Item VB21. The "after" field will be blank until an inspection is selected in Item VB21.

Coding:

Refer to RATING CODES located at the beginning of Section 1A.

VB73 Paint Condition Rating Before and After

Inventory > Preservation and Rehab > Preservation and Rehab Detail

Description:

This two-part item is used to record the Paint Condition Rating before and after the work is complete.

Procedure:

The "before" field is automatically filled in from Item 6B36 from the inspection record selected in Item VB20. The "before" field will be blank until an inspection is selected in Item VB20. The "after" field is automatically filled in from Item 6B36 from the inspection record selected in Item VB21. The "after" field will be blank until an inspection is selected in Item VB21.

Coding:

Refer to coding guide for Item 6B36.

VB74 Material Type Before and After (Main, Approach)

Inventory > Preservation and Rehab > Preservation and Rehab Detail

Description:

This two-part item is used to record the kind of material used for the main load carrying members for the main unit and approach unit (if applicable) of the bridge before and after the work is complete.

Procedure:

The “before” material type for main and approach spans is automatically filled in from Item 6A26 when the project record is created. This field will remain editable after automation for entering historical coding. Select the “after” material type for main and approach spans from the dropdown list for after the work is complete. The main unit applies to all spans of most bridges, to the major unit of sizable structures, or to a unit of material or design different from that of the approach spans. Clicking the Export button below the table will automatically update Item 6A26 with the “after” material type for main and approach spans.

Coding:

See coding for Item 6A26.

VB75 Physical Makeup Before and After (Main, Approach)

Inventory > Preservation and Rehab > Preservation and Rehab Detail

Description:

This two-part item is used to record the physical makeup of the primary load carrying members (when appropriate, or subcomponents of a major bridge) for the main unit and approach unit (if applicable) of the bridge before and after the work is complete.

Procedure:

The “before” physical makeup for main and approach spans is automatically filled in from Item 6A27 when the project record is created. This field will remain editable after automation for entering historical coding. Select the “after” physical makeup of the primary load carrying members for main and approach spans from the dropdown list for after the work is complete. The main unit applies to all spans of most bridges, to the major unit of sizable structures, or to a unit of material or design different from that of the approach spans. Clicking the Export button below the table will automatically update Item 6A27 with the “after” physical makeup for the main and approach spans.

Coding:

See coding for Item 6A27.

VB76 Span Interaction Before and After (Main, Approach)

Inventory > Preservation and Rehab > Preservation and Rehab Detail

Description:

This two-part item is used to record whether or not there is composite action and continuity for the main unit and approach unit (if applicable) of the bridge before and after the work is complete.

Procedure:

The “before” span interaction for main and approach spans is automatically filled in from Item 6A28 when the project record is created. This field will remain editable after automation for entering

historical coding. Select the “after” span interaction for main and approach spans from the dropdown list for after the work is complete. The main unit applies to all spans of most bridges, to the major unit of sizable structures, or to a unit of material or design different from that of the approach spans. Clicking the Export button below the table will automatically update Item 6A28 with the “after” span interaction for the main and approach spans.

Coding:

See coding for Item 6A28.

VB77 Structural Configuration Before and After (Main, Approach)

Inventory > Preservation and Rehab > Preservation and Rehab Detail

Description:

This two-part item is used to record the basic structural configuration for the main unit and approach unit (if applicable) of the bridge before and after the work is complete.

Procedure:

The “before” structural configuration for main and approach spans is automatically filled in from Item 6A29 when the project record is created. This field will remain editable after automation for entering historical coding. Select the “after” structural configuration for main and approach spans from the dropdown list for after the work is complete. The main unit applies to all spans of most bridges, to the major unit of sizable structures, or to a unit of material or design different from that of the approach spans. Clicking the Export button below the table will automatically update Item 6A29 with the “after” structural configuration for the main and approach spans.

Coding:

See coding for Item 6A29.

VB78 Square Footage of Painting

Inventory > Preservation and Rehab > Preservation and Rehab Detail

Description:

This item is used to record the area painted in square feet.

Procedure:

This item records the area of the painting done on the superstructure.

Coding:

Enter the painting area to the nearest square foot.

VB79 Paint Cost

Inventory > Preservation and Rehab > Preservation and Rehab Detail

Description:

This item is used to record the cost of the painting work (from Item VB78) in dollars. This includes costs for material and installation.

Procedure:

This item is used to record the cost of the new paint placed on the bridge for this project.

Coding:

Enter the painting cost in dollars to the cent.

VB80 Paint Cost per SF

Inventory > Preservation and Rehab > Preservation and Rehab Detail

Description:

This item is only filled in if the project includes superstructure/culvert/paint work on the bridge and Items VB78 and VB79 are filled out. This item is used to record the cost of the paint per square foot.

Procedure:

This item is automatically filled in from Items VB78 and VB79.

Coding:

The painting cost per square foot.

VB81 through VB89 (Not Used - Reserved for Future Use)

VB90 Substructure Work Type 🚧

Inventory > Preservation and Rehab > Preservation and Rehab Detail

Description:

This item is used to record the type of substructure work being done on the bridge.

Procedure:

This item is a multi-select checkbox field used to capture every type of substructure work done for the current project. Select the most appropriate coding from the options below.

Coding:

- | | | | |
|---|----------------------------------|----|----------------------------------|
| 1 | Bridge Seat or Pier Cap Repair | 6 | Underpinning Abutment or Pier |
| 2 | Concrete Abutment or Pier Repair | 7 | Backfill Scour Hole |
| 3 | Steel Abutment or Pier Repair | 8 | Install Rock Protection |
| 4 | Masonry Abutment or Pier Repair | 9 | Other Channel/Scour Improvements |
| 5 | Other Abutment or Pier Repair | 10 | Other |

VB91 Substructure Condition Rating Before and After

Inventory > Preservation and Rehab > Preservation and Rehab Detail

Description:

This two-part item is used to record the Substructure Condition Rating before and after the work is complete.

Procedure:

The "before" field is automatically filled in from Item 1A02 from the inspection record selected in Item VB20. The "before" field will be blank until an inspection is selected in Item VB20. The "after" field is automatically filled in from Item 1A02 from the inspection record selected in Item VB21. The "after" field will be blank until an inspection is selected in Item VB21.

Coding:

Refer to **RATING CODES** located at the beginning of Section 1A.

Appendix A

Create New Structures Form

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**APPENDIX A
CREATE NEW STRUCTURES FORM**

CREATE NEW STRUCTURE			
ITEMS REQUIRED TO CREATE A NEW STRUCTURE PRIOR TO THE INITIAL INSPECTION (shaded fields required for NBIS length structures, shaded fields with an * not required for local < 20')			
IDENTIFICATION			
5A01	Structure ID	<input style="width: 100%;" type="text"/>	
5A02	Name	<input style="width: 100%;" type="text"/>	
5A03	NBI Structure No.	<input style="width: 100%;" type="text"/>	(BRKEY - automatically generated)
Local Under 20ft? Yes or No			
LOCATION/SERVICE/MANAGEMENT			
5A04	District	<input style="width: 100%;" type="text"/>	5A05 County <input style="width: 100%;" type="text"/>
5A06	City/Town/Place	<input style="width: 100%;" type="text"/>	5A07 Feature Intersect <input style="width: 100%;" type="text"/>
5A08	Facility Carried	<input style="width: 100%;" type="text"/>	5A09 Location <input style="width: 100%;" type="text"/>
5A10	Latitude	<input style="width: 100%;" type="text"/>	5A11 Longitude <input style="width: 100%;" type="text"/>
5A15	Year Built	<input style="width: 100%;" type="text"/>	5A17 Type of Service On <input style="width: 100%;" type="text"/>
5A18	Under	<input style="width: 100%;" type="text"/>	5A19 #Lanes Under* <input style="width: 100%;" type="text"/>
5A20	Maint Resp	<input style="width: 100%;" type="text"/>	5A21 Owner <input style="width: 100%;" type="text"/>
DECK/SPAN INFORMATION			
5B02	Deck Surface Type*	<input style="width: 100%;" type="text"/>	5B03 Deck Mem. Type* <input style="width: 100%;" type="text"/>
5B04	Deck Protection*	<input style="width: 100%;" type="text"/>	5B05 Left Curb Width* <input style="width: 100%;" type="text"/>
5B06	Right Curb Width*	<input style="width: 100%;" type="text"/>	5B07 Deck Width* <input style="width: 100%;" type="text"/>
5B09	Skew*	<input style="width: 100%;" type="text"/>	5B10 Structure Flared* <input style="width: 100%;" type="text"/>
5B11	No. Of Main Spans*	<input style="width: 100%;" type="text"/>	5B14 No. of Appr. Spans* <input style="width: 100%;" type="text"/>
5B17	Max. Span Length*	<input style="width: 100%;" type="text"/>	5B18 Structure Length <input style="width: 100%;" type="text"/>
5B20	Total Length	<input style="width: 100%;" type="text"/>	
Notes: <input style="width: 100%; height: 20px;" type="text"/>			
CLASSIFICATION			
5E01	NBIS Bridge Length*	<input style="width: 100%;" type="text"/>	5E02 Parallel Structure* <input style="width: 100%;" type="text"/>
5E03	Temporary Struc.*	<input style="width: 100%;" type="text"/>	5E04 Historical Significance* <input style="width: 100%;" type="text"/>
GENERAL			
4A08	SCBI*	<input style="width: 100%;" type="text"/>	VP02 Posting Status <input style="width: 100%;" type="text"/>
6A06	Sub Agency	<input style="width: 100%;" type="text"/>	6A19 Bus. Plan Ntwk.* <input style="width: 100%;" type="text"/>
6A23	Owner Desc.*	<input style="width: 100%;" type="text"/>	Culvert? Yes or No
STRUCTURE TYPE			
		Main	Approach
6A26	Material	<input style="width: 100%;" type="text"/>	<input style="width: 100%;" type="text"/>
6A27	Physical	<input style="width: 100%;" type="text"/>	<input style="width: 100%;" type="text"/>
6A28	Span Interact	<input style="width: 100%;" type="text"/>	<input style="width: 100%;" type="text"/>
6A29	Struct. Config.	<input style="width: 100%;" type="text"/>	<input style="width: 100%;" type="text"/>
DECK INFO			
6A38	Dept. Struct. Type*	<input style="width: 100%;" type="text"/>	6A41 No. of joints* <input style="width: 100%;" type="text"/>
6A42	Rebar type	<input style="width: 100%;" type="text"/>	6A43 Appr. Pav. Width <input style="width: 100%;" type="text"/>
FRACTURE CRITICAL			
		Main	Approach
6A44	Group No.*	<input style="width: 100%;" type="text"/>	<input style="width: 100%;" type="text"/>
6A45	Mem. Type*	<input style="width: 100%;" type="text"/>	<input style="width: 100%;" type="text"/>
6A46	Fatig. Sus.*	<input style="width: 100%;" type="text"/>	<input style="width: 100%;" type="text"/>
6A47	Material*	<input style="width: 100%;" type="text"/>	<input style="width: 100%;" type="text"/>
6A48	ADTT*	<input style="width: 100%;" type="text"/>	<input style="width: 100%;" type="text"/>
ROADWAY			
5C15	Detour Length*	<input style="width: 100%;" type="text"/>	
5C26	Appr. Road*	<input style="width: 100%;" type="text"/>	
5C27	Roadway*	<input style="width: 100%;" type="text"/>	
LOAD RATING			
IR03	Calculation Date*	<input style="width: 100%;" type="text"/>	IR06 Load Rating. Method* <input style="width: 100%;" type="text"/>
IR04	Load Type*	<input style="width: 100%;" type="text"/>	IR10 Inventory Rating* <input style="width: 100%;" type="text"/>
IR05	NBI*	<input style="width: 100%;" type="text"/>	IR11 Operating Rating* <input style="width: 100%;" type="text"/>

**APPENDIX A
CREATE NEW STRUCTURES FORM**

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Appendix B

County, City, Borough and Township Codes

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APPENDIX B
Coding for Item 5A06

ADAMS - 01

District 8-0

Boroughs:

401 ABBOTTSTOWN
402 ARENDTSTVILLE
403 BENDERSVILLE
404 BIGLERVILLE
405 EAST BERLIN
406 FAIRFIELD
407 GETTYSBURG
408 LITTLESTOWN
409 MCSHERRYSTOWN
410 NEW OXFORD
411 YORK SPRINGS
412 BONNEAUVILLE
413 CARROLL VALLEY

Townships, 2nd Class:

201 BERWICK
202 BUTLER
203 CONEWAGO
204 CUMBERLAND
205 FRANKLIN
206 FREEDOM
207 GERMANY
208 HAMILTON
209 HAMILTONBAN
210 HIGHLAND
211 HUNTINGTON
212 LATIMORE
213 LIBERTY
214 MENALLEN
215 MOUNT JOY
216 MOUNT PLEASANT
217 OXFORD
218 READING
219 STRABAN
220 TYRONE
221 UNION

ALLEGHENY - 02

District 11-0

Cities:

301 PITTSBURGH
302 CLAIRTON
303 DUQUESNE
304 MCKEESPORT

Boroughs:

401 ASPINWALL
402 AVALON
403 BALDWIN
404 BELLEVUE
405 BEN AVON
406 BEN AVON HEIGHTS
407 BETHEL PARK
408 BLAWNOX
409 BRACKENRIDGE
410 BRADDOCK
411 BRADDOCK HILLS
412 BRADFORDWOODS
413 BRENTWOOD
414 BRIDGEVILLE
415 CARNEGIE
416 CASTLE SHANNON
417 CHALFANT
418 CHESWICK
419 CHURCHILL
420 CORAOPOLIS
421 CRAFTON
422 DORMONT
423 DRAVOSBURG
424 EAST MCKEESPORT
425 EAST PITTSBURGH
426 EDGEWOOD

427 EDGEWORTH

428 ELIZABETH

429 EMSWORTH

430 ETNA

431 FOREST HILLS

432 FOX CHAPEL

433 GLASSPORT

434 GLENFIELD

435 GREENTREE

436 HAYSVILLE

437 HEIDELBERG

438 HOMESTEAD

439 INGRAM

440 JEFFERSON HILLS

441 LEETSDALE

442 LIBERTY

443 LINCOLN

444 MCKEES ROCKS

445 MILLVALE

446 MONROEVILLE

447 MT OLIVER

448 MUNHALL

449 NORTH BRADDOCK

450 OAKDALE

451 OAKMONT

452 OSBORNE

453 PITCAIRN

454 PLEASANT HILLS

455 PORT VUE

456 RANKIN

457 ROSSLYN FARMS

458 SEWICKLEY

459 SEWICKLEY HEIGHTS

460 SEWICKLEY HILLS

461 SHARPSBURG

462 SPRINGDALE

463 SWISSVALE

464 TARENTUM

465 THORNBURG

466 PLUM

467 TURTLE CREEK

468 VERONA

469 VERSAILLES

470 WALL

471 WEST ELIZABETH

472 WEST HOMESTEAD

473 WEST MIFFLIN

474 WEST VIEW

475 WHITAKER

476 WHITEHALL

477 WHITE OAK

478 WILKINSBURG

479 WILMERDING

480 BELL ACRES

481 FRANKLIN PARK

482 PENNSBURY VILLAG

Townships, 1st Class:

101 BALDWIN
102 COLLIER
103 CRESCENT
104 EAST DEER
105 ELIZABETH
106 HARRISON
107 LEET
108 MCCANDLESS
109 MT LEBANON
110 NEVILLE
111 NORTH VERSAILLE
112 OHARA
113 PENN HILLS
114 RESERVE
115 ROBINSON
116 ROSS
117 SCOTT
118 SHALER
119 SOUTH FAYETTE
120 SOUTH VERSAILLE

121 SPRINGDALE

122 STOWE

123 UPPER ST CLAIR

124 WILKINS

125 ALEPPO

126 KENNEDY

Townships, 2nd Class:

202 FAWN
203 FINDLAY
204 FORWARD
206 FRAZER
207 HAMPTON
208 HARMAR
209 INDIANA
211 KILBUCK
212 MARSHALL
213 MOON
214 NORTH FAYETTE
215 OHIO
216 PINE
217 RICHLAND
219 SOUTH PARK
220 WEST DEER

ARMSTRONG - 03

District 10-0

Cities:

301 PARKER CITY

Boroughs:

401 APOLLO
402 APPLEWOLD
403 ATWOOD
404 DAYTON
405 ELBERTON
406 FORD CITY
407 FORD CLIFF
408 FREEPORT
409 KITTANNING
410 LEECHBURG
411 MANORVILLE
412 NORTH APOLLO
414 RURAL VALLEY
415 SOUTH BETHLEHEM
416 WEST KITTANNING
417 WORTHINGTON

Townships, 2nd Class:

201 BETHEL
202 BOGGS
203 BRADYS BEND
204 BURRELL
205 CADOGAN
206 COWANSHANNOCK
207 EAST FRANKLIN
208 GILPIN
209 HOVEY
210 KISKIMINETAS
211 KITTANNING
212 MADISON
213 MAHONING
214 MANOR
215 NORTH BUFFALO
216 PARKS
217 PERRY
218 PINE
219 PLUMCREEK
220 RAYBURN
221 REDBANK
222 SOUTH BEND
223 SOUTH BUFFALO
224 SUGARCREEK
225 VALLEY
226 WASHINGTON
227 WAYNE
228 WEST FRANKLIN

BEAVER - 04

District 11-0

Cities:

301 BEAVER FALLS
302 ALIQUIPPA

Boroughs:

402 AMBRIDGE
403 BADEN
404 BEAVER
405 BIG BEAVER
406 BRIDGEWATER
407 CONWAY
408 DARLINGTON
409 EAST ROCHESTER
410 EASTVALE
411 ECONOMY
412 FALLSTON
413 FRANKFORT SPRINGS
414 FREEDOM
415 GEORGETOWN
416 GLASGOW
417 HOMEWOOD
418 HOOKSTOWN
419 INDUSTRY
420 KOPPEL
421 MIDLAND
422 MONACA
423 NEW BRIGHTON
424 NEW GALILEE
425 PATTERSON HEIGHTS
426 ROCHESTER
427 SHIPPINGPORT
428 SOUTH HEIGHTS
429 WEST MAYFIELD
430 OHIOVILLE

Townships, 1st Class:

101 VANPORT
102 HARMONY
103 HOPEWELL
104 PATTERSON
105 ROCHESTER

Townships, 2nd Class:

201 BRIGHTON
202 CENTER
203 CHIPPEWA
204 DARLINGTON
205 DAUGHERTY
206 FRANKLIN
207 GREENE
208 HANOVER
209 INDEPENDENCE
210 MARION
211 NEW SEWICKLEY
212 NORTH SEWICKLEY
214 POTTER
215 PULASKI
216 RACCOON
217 SOUTH BEAVER
218 WHITE

BEDFORD - 05

District 9-0

Boroughs:

401 BEDFORD
402 COALDALE
403 EVERETT
404 HOPEWELL
405 HYNDMAN
406 MANNS CHOICE
407 NEW PARIS
408 PLEASANTVILLE
409 RAINSBURG
410 SAINT CLAIRSVILLE

411 SAXTON

412 SCHELLSBURG

413 WOODBURY

Townships, 2nd Class:

201 BEDFORD
202 BLOOMFIELD
203 BROADTOP
204 COLERAIN
205 CUMBERLAND VALLE
206 EAST PROVIDENCE
207 EAST ST CLAIR
208 HARRISON
209 HOPEWELL
210 JUNIATA
211 KIMMEL
212 KING
213 LIBERTY
214 LINCOLN
215 LONONDERRY
216 MANN
217 MONROE
218 NAPIER
219 SNAKE SPRING
220 SOUTHAMPTON
221 SOUTH WOODBURY
222 PAVIA
226 WEST PROVIDENCE
227 WEST ST CLAIR
228 WOODBURY

BERKS - 06

District 05-0

Cities:

301 READING

Boroughs:

401 BALLY
402 BECHTELSVILLE
403 BERNVILLE
404 BIRDSBORO
405 BOYERTOWN
406 CENTERPORT
407 FLEETWOOD
408 HAMBURG
409 KENHORST
410 KUTZTOWN
411 LAURELDALE
412 LENHARTSVILLE
413 LYONS
414 MOHNTON
415 MT PENN
416 ROBESONIA
417 ST LAWRENCE
418 SHILLINGTON
419 SHOEMAKERSVILLE
420 SINKING SPRING
421 STRAUSTOWN
422 TEMPLE
423 TOPTON
424 WERNERSVILLE
425 WEST LAWN
426 LEESPORT
427 WEST READING
428 WOMELSDORF
429 WYOMISSING
430 WYOMISSING HILL
431 NEW MORGAN

Townships, 1st Class:

101 COLEBROOKDALE
102 MUHLENBERG
103 CUMRU

Townships, 2nd Class:

201 ALBANY
202 ALSACE

APPENDIX B
Coding for Item 5A06

BERKS - 06 (cont)
District 05-0

Townships, 2nd Class:
203 AMITY
204 BERN
205 BETHEL
206 BRECKNOCK
207 CAERNARVON
208 CENTRE
211 DISTRICT
212 DOUGLASS
213 EARL
214 EXETER
215 GREENWICH
216 HEIDELBERG
217 HEREFORD
218 JEFFERSON
219 LONGSWAMP
220 LOWER ALSACE
221 LOWER HEIDELBERG
222 MAIDEN CREEK
223 MARION
224 MAXATAWNY
226 NORTH HEIDELBERG
227 OLEY
228 ONTELAUNEE
229 PENN
230 PERRY
231 PIKE
232 RICHMOND
233 ROBESON
234 ROCKLAND
235 RUSCOMBMANOR
236 SOUTH HEIDELBERG
237 SPRING
238 TILDEN
239 TULPEHOCKEN
240 UNION
241 UPPER BERN
242 UPPER TULPEHOCKEN
243 WASHINGTON
244 WINDSOR

BLAIR - 07
District 09-0

Cities:
301 ALTOONA

Boroughs:
401 BELLWOOD
402 DUNCANVILLE
403 HOLLIDAYSBURG
404 MARTINSBURG
405 NEWRY
406 ROARING SPRING
407 TYRONE
408 WILLIAMSBURG

Townships, 2nd Class:
201 ALLEGHENY
202 ANTIS
203 BLAIR
204 CATHARINE
205 FRANKSTOWN
206 FREEDOM
207 GREENFIELD
208 HUSTON
209 JUNIATA
210 LOGAN
211 NORTH WOODBURY
212 SNYDER
213 TAYLOR
214 TYRONE
215 WOODBURY

BRADFORD - 08
District 03-0

Boroughs:
401 ALBA
402 ATHENS
403 BURLINGTON
404 CANTON
405 LERAYSVILLE
406 MONROE
407 NEW ALBANY
408 ROME
409 SAYRE
410 SOUTH WAVERLY
411 SYLVANIA
412 TOWANDA
413 TROY
414 WYALUSING

Townships, 2nd Class:
201 ALBANY
202 ARMENIA
203 ASYLUM
204 ATHENS
206 BURLINGTON
207 CANTON
208 COLUMBIA
209 FRANKLIN
210 GRANVILLE
211 HERRICK
212 LEROY
213 LITCHFIELD
214 MONROE
215 NORTH TOWANDA
216 ORWELL
217 OVERTON
218 PIKE
219 RIDGEBURY
220 ROME
221 SHESHEQUIN
222 SMITHFIELD
223 SOUTH CREEK
224 SPRINGFIELD
225 STANDING STONE
226 STEVENS
227 TERRY
228 TOWANDA
229 TROY
230 TUSCARORA
231 ULSTER
232 WARREN
233 WELLS
234 WEST BURLINGTON
235 WILMOT
236 WINDHAM
237 WYALUSING
238 WYSOX

BUCKS - 09
District 06-0

Boroughs:
401 BRISTOL
402 CHALFONT
403 DOYLESTOWN
404 DUBLIN
405 HULMEVILLE
406 IVYLAND
407 LANGHORNE
408 LANGHORNE MANOR
409 MORRISVILLE
410 NEW BRITAIN
411 NEW HOPE
412 NEWTOWN
413 PENNDEL
414 PERKASIE
415 QUAKERTOWN
416 RICHLANDTOWN

417 RIEGELSVILLE
418 SELLERSVILLE
419 SILVERDALE
420 TRUMBBAUERSVILLE
421 TULLYTOWN
422 YARDLEY

Townships, 1st Class:
101 BRISTOL

Townships, 2nd Class:
201 BEDMINSTER
202 BENSALEM
203 BRIDGETON
204 BUCKINGHAM
205 DOYLESTOWN
206 DURHAM
207 EAST ROCKHILL
208 FALLS
209 HAYCOCK
210 HILLTOWN
211 LOWER MAKEFIELD
212 LOWER SOUTHAMPT
213 MIDDLETOWN
214 MILFORD
215 NEW BRITAIN
216 NEWTOWN
217 NOCKAMIXON
218 NORTHAMPTON
219 PLUMSTEAD
220 RICHLAND
221 SOLEBURY
222 SPRINGFIELD
223 TINICUM
224 UPPER MAKEFIELD
225 UPPER SOUTHAMPT
226 WARMINSTER
227 WARRINGTON
228 WARWICK
229 WEST ROCKHILL
230 WRIGHTSTOWN

BUTLER - 10
District 10-0

Cities:
301 BUTLER

Boroughs:
401 BRUIN
402 CALLERY
403 CHERRY VALLEY
404 CONNOQUENESSING
405 EAST BUTLER
406 EAU CLAIRE
407 EVANS CITY
408 FAIRVIEW
409 HARMONY
410 HARRISVILLE
411 KARN'S CITY
412 MARS
413 CHICORA
414 PETROLIA
415 PORTERSVILLE
416 PROSPECT
417 SAXONBURG
418 SLIPPERY ROCK
419 VALENCIA
420 WEST LIBERTY
421 WEST SUNBURY
422 ZELIENOPE
423 SEVEN FIELDS

Townships, 1st Class:
101 BUTLER

Townships, 2nd Class:
201 ADAMS
202 ALLEGHENY
203 BRADY
204 BUFFALO
205 CENTER
206 CHERRY
207 CLAY
208 CLEARFIELD
209 CLINTON
210 CONCORD
211 CONNOQUENESSING
212 CRANBERRY
213 DONEGAL
214 FAIRVIEW
215 FORWARD
216 FRANKLIN
217 JACKSON
218 JEFFERSON
219 LANCASTER
220 MARION
221 MERCER
222 MIDDLESEX
223 MUDDY CREEK
224 OAKLAND
225 PARKER
226 PENN
227 SLIPPERY ROCK
228 SUMMIT
229 VENANGO
230 WASHINGTON
231 WINFIELD
232 WORTH

CAMBRIA - 11
District 09-0

Cities:
301 JOHNSTOWN

Boroughs:
401 ASHVILLE
402 BARNESBORO
403 BROWNSTOWN
404 CARROLLTOWN
405 CASSANDRA
406 CHEST SPRINGS
407 CRESSON
408 DAISYTOWN
409 DALE
410 EAST CONEMAUGH
411 EBENSBURG
412 EHRENFELD
413 FERNDAL
414 FRANKLIN
415 GALLITZIN
416 GEISTOWN
417 HASTINGS
418 LILLY
419 LORAIN
420 LORETTO
421 NANTY GLO
422 PATTON
423 PORTAGE
424 SANKERTOWN
425 SCALP LEVEL
426 SOUTH FORK
427 SOUTHMONT
428 SPANGLER
429 SUMMERHILL
430 TUNNEL HILL
431 VINTONDALE
432 WESTMONT
433 WILMORE
434 NORTHERN CAMBRIA

Townships, 1st Class:
101 STONYCREEK

Townships, 2nd Class:
201 ADAMS
202 ALLEGHENY
203 BARR
204 BLACKLICK
205 CAMBRIA
206 CHEST
207 CLEARFIELD
208 CONEMAUGH
209 CRESSON
210 CROYLE
211 DEAN
212 EAST CARROLL
213 EAST TAYLOR
214 ELDER
215 GALLITZIN
216 JACKSON
217 LOWER YODER
218 MIDDLE TAYLOR
219 MUNSTER
220 PORTAGE
221 READE
222 RICHLAND
223 SUMMERHILL
224 SUSQUEHANNA
225 UPPER YODER
226 WASHINGTON
227 WEST CARROLL
228 WEST TAYLOR
229 WHITE

CAMERON - 12
District 02-0

Boroughs:
401 DRIFTWOOD
402 EMPORIUM

Townships, 2nd Class:
201 GIBSON
202 GROVE
203 LUMBER
204 PORTAGE
205 SHIPPEN

CARBON - 13
District 05-0

Boroughs:
401 BEAVER MEADOWS
402 BOWMANSTOWN
403 EAST SIDE
404 JIM THORPE
405 LAUSFORD
406 LEHIGHTON
407 PALMERTON
408 PARRYVILLE
409 SUMMIT HILL
410 WEATHERLY
411 WEISSPORT
412 NESQUEHONING

Townships, 2nd Class:
201 BANKS
202 EAST PENN
203 FRANKLIN
204 KIDDER
205 LAUSANNE
206 LEHIGH
207 LOWER TOWAMENSI
208 MAHONING
210 PACKER
211 PENN FOREST
212 TOWAMENSING

APPENDIX B
Coding for Item 5A06

CENTRE - 14

District 02-0

Boroughs:

- 401 BELLEFONTE
- 402 CENTRE HALL
- 403 HOWARD
- 404 MILESBURG
- 405 MILLHEIM
- 406 PHILIPSBURG
- 407 PORT MATILDA
- 408 SNOW SHOE
- 409 SOUTH PHILIPSBURG
- 410 STATE COLLEGE
- 411 UNIONVILLE

Townships, 2nd Class:

- 201 BENNER
- 202 BOGGS
- 203 BURNSIDE
- 204 COLLEGE
- 205 CURTIN
- 206 FERGUSON
- 207 GREGG
- 208 HAINES
- 209 HALF MOON
- 210 HARRIS
- 211 HOWARD
- 212 HUSTON
- 213 LIBERTY
- 214 MARION
- 215 MILES
- 216 PATTON
- 217 PENN
- 218 POTTER
- 219 RUSH
- 220 SNOW SHOE
- 221 SPRING
- 222 TAYLOR
- 223 UNION
- 224 WALKER
- 225 WORTH

CHESTER - 15

District 06-0

Cities:

- 301 COATESVILLE

Boroughs:

- 401 ATGLEN
- 402 AVONDALE
- 403 DOWNINGTOWN
- 404 ELVERSON
- 405 HONEY BROOK
- 406 KENNETT SQUARE
- 407 MALVERN
- 408 MODENA
- 409 OXFORD
- 410 PARKESBURG
- 411 PHOENIXVILLE
- 412 SOUTH COATESVILLE
- 413 SPRING CITY
- 414 WEST CHESTER
- 415 WEST GROVE

Townships, 1st Class:

- 101 CALN

Townships, 2nd Class:

- 201 BIRMINGHAM
- 202 CHARLESTOWN
- 203 EAST BRADFORD
- 204 EAST BRANDYWINE
- 205 EAST CALN
- 206 EAST COVENTRY
- 207 EAST FALLOWFIELD

- 208 EAST GOSHEN
- 209 EAST MARLBOROUGH
- 210 EAST NANTMEAL
- 211 EAST NOTTINGHAM
- 212 EAST PIKELAND
- 213 EAST VINCENT
- 214 EAST WHITELAND
- 215 EASTTOWN
- 216 ELK
- 217 FRANKLIN
- 218 HIGHLAND
- 219 HONEY BROOK
- 220 KENNETT
- 221 LONDON BRITAIN
- 222 LONDON GROVE
- 223 LONDONDERRY
- 224 LOWER OXFORD
- 225 NEW GARDEN
- 226 NEW LONDON
- 227 NEWLIN
- 228 NORTH COVENTRY
- 229 PENN
- 230 PENNSBURG
- 231 POCOPSON
- 232 SADSBUURY
- 233 SCHUYLKILL
- 234 SOUTH COVENTRY
- 235 THORNBURY
- 236 TREDYFFRIN
- 237 UPPER OXFORD
- 238 UPPER UWCHLAN
- 239 UWCHLAN
- 240 VALLEY
- 241 WALLACE
- 242 WARWICK
- 243 WEST BRADFORD
- 244 WEST BRANDYWINE
- 245 WEST CALN
- 246 WEST FALLOWFIELD
- 247 WEST GOSHEN
- 248 WEST MARLBOROUGH
- 249 WEST NANTMEAL
- 250 WEST NOTTINGHAM
- 251 WEST PIKELAND
- 252 WEST SADSBUURY
- 253 WEST VINCENT
- 254 WEST WHITELAND
- 255 WESTTOWN
- 256 WILLISTOWN

CLARION - 16

District 10-0

Boroughs:

- 401 CALLENSBURG
- 402 CLARION
- 403 EAST BRADY
- 404 FOXBURG
- 405 HAWTHORNE
- 406 KNOX
- 407 NEW BETHLEHEM
- 408 RIMERSBURG
- 409 SAINT PETERSBURG
- 410 SHIPPENVILLE
- 411 SLIGO
- 412 STRATTANVILLE

Townships, 2nd Class:

- 201 ASHLAND
- 202 BEAVER
- 203 BRADY
- 204 CLARION
- 205 ELK
- 206 FARMINGTON
- 207 HIGHLAND
- 208 KNOX
- 209 LICKING
- 210 LIMESTONE

CLEARFIELD - 17

District 02-0

Cities:

- 301 DUBOIS

Boroughs:

- 401 BRISBIN
- 402 BURNSIDE
- 403 CHESTER HILL
- 404 CLEARFIELD
- 405 COALPORT
- 406 CURWENSVILLE
- 407 GLEN HOPE
- 408 GRAMPIAN
- 409 HOUTZDALE
- 410 IRVONA
- 411 LUMBER CITY
- 412 MAHAFFEY
- 413 NEWBURG
- 414 NEW WASHINGTON
- 415 OSCEOLA MILLS
- 416 RAMEY
- 417 TROUTVILLE
- 418 WALLACETON
- 419 WESTOVER

Townships, 2nd Class:

- 201 BECCARIA
- 202 BELL
- 203 BIGLER
- 204 BLOOM
- 205 BOGGS
- 206 BRADFORD
- 207 BRADY
- 208 BURNSIDE
- 209 CHEST
- 210 COOPER
- 211 COVINGTON
- 212 DECATUR
- 213 FERGUSON
- 214 GIRARD
- 215 GOSHEN
- 216 GRAHAM
- 217 GREENWOOD
- 218 GULICH
- 219 HUSTON
- 220 JORDAN
- 221 KARTHAUS
- 222 KNOX
- 223 LAWRENCE
- 224 MORRIS
- 225 PENN
- 226 PIKE
- 227 PINE
- 228 SANDY
- 229 UNION
- 230 WOODWARD

CLINTON - 18

District 02-0

Cities:

- 301 LOCK HAVEN

Boroughs:

- 401 AVIS
- 402 BEECH CREEK
- 403 FLEMINGTON
- 404 LOGANTON
- 405 MILL HALL
- 406 RENOVO
- 407 SOUTH RENOVO

Townships, 2nd Class:

- 201 ALLISON
- 202 BALD EAGLE
- 203 BEECH CREEK
- 204 CASTANEA
- 205 CHAPMAN
- 206 COLEBROOK
- 207 CRAWFORD
- 208 DUNNSTABLE
- 209 EAST KEATING
- 210 GALLAGHER
- 211 GREENE
- 212 GRUGAN
- 213 LAMAR
- 214 LEIDY
- 215 LOGAN
- 216 NOYES
- 217 PINE CREEK
- 218 PORTER
- 219 WAYNE
- 220 WEST KEATING
- 221 WOODWARD

COLUMBIA - 19

District 03-0

Boroughs:

- 401 BENTON
- 402 BERWICK
- 404 BRIAR CREEK
- 405 CATAWISSA
- 406 CENTRALIA
- 407 MILLVILLE
- 408 ORANGEVILLE
- 409 STILLWATER

Town

XXX Bloomsburg

Townships, 2nd Class:

- 201 BEAVER
- 202 BENTON
- 203 BRIAR CREEK
- 204 CATAWISSA
- 205 CLEVELAND
- 206 CONYNGHAM
- 207 FISHING CREEK
- 208 FRANKLIN
- 209 GREENWOOD
- 210 HEMLOCK
- 211 JACKSON
- 212 LOCUST
- 213 MADISON
- 214 MAIN
- 215 MIFFLIN
- 216 MONTOUR
- 217 MT PLEASANT
- 218 NORTH CENTRE
- 219 ORANGE
- 220 PINE
- 221 ROARING CREEK
- 222 SCOTT
- 223 SOUTH CENTRE
- 224 SUGARLOAF

CRAWFORD - 20

District 01-0

Cities:

- 301 MEADVILLE
- 302 TITUSVILLE

Boroughs:

- 401 BLOOMING VALLEY
- 402 CAMBRIDGE SPRING
- 403 CENTERVILLE
- 404 COCHRANTON
- 405 CONNEAUT LAKE
- 406 CONNEAUTVILLE
- 407 HYDETOWN
- 408 LINESVILLE
- 409 SAEGERTOWN
- 410 SPARTANSBURG
- 411 SPRINGBORO
- 412 TOWNVILLE
- 413 VENANGO
- 414 WOODCOCK

Townships, 2nd Class:

- 201 ATHENS
- 202 BEAVER
- 203 BLOOMFIELD
- 204 CAMBRIDGE
- 205 CONNEAUT
- 206 CUSSEWAGO
- 207 EAST FAIRFIELD
- 208 EAST FALLOWFIELD
- 209 EAST MEAD
- 210 FAIRFIELD
- 211 GREENWOOD
- 212 HAYFIELD
- 213 NORTH SHENANGO
- 214 OIL CREEK
- 215 PINE
- 216 RANDOLPH
- 217 RICHMOND
- 218 ROCKDALE
- 219 ROME
- 220 SADSBUURY
- 221 SOUTH SHENANGO
- 222 SPARTA
- 223 SPRING
- 224 STEUBEN
- 225 SUMMERHILL
- 226 SUMMIT
- 227 TROY
- 228 UNION
- 229 VENANGO
- 230 VERNON
- 231 WAYNE
- 232 WEST FALLOWFIELD
- 233 WEST MEAD
- 234 WEST SHENANGO
- 235 WOODCOCK

CUMBERLAND - 21

District 08-0

Boroughs:

- 401 CAMP HILL
- 402 CARLISLE
- 403 LEMOYNE
- 404 MECHANICSBURG
- 405 MOUNT HOLLY SPRING
- 406 NEWBURG
- 407 NEW CUMBERLAND
- 408 NEWVILLE
- 409 SHIPPENSBURG
- 410 SHIREMANSTOWN
- 412 WORMLEYSBURG

Townships, 1st Class:

- 101 EAST PENNSBORO
- 102 LOWER ALLEN
- 103 HAMPDEN
- 104 UPPER ALLEN

Townships, 2nd Class:

- 201 COOKE
- 202 DICKINSON

**APPENDIX B
Coding for Item 5A06**

CUMBERLAND - 21 (cont)
District 08-0

Townships, 2nd Class:
203 HOPEWELL
204 LOWER FRANKFORD
205 LOWER MIFFLIN
206 MIDDLESEX
207 MONROE
208 NORTH MIDDLETON
209 NORTH NEWTON
210 PENN
211 SHIPPENSBURG
212 SILVER SPRING
213 SOUTH MIDDLETON
214 SOUTH NEWTON
215 SOUTHAMPTON
217 UPPER FRANKFORD
218 UPPER MIFFLIN
219 WEST PENNSBORO

DAUPHIN - 22
District 08-0

Cities:
301 HARRISBURG

Boroughs:
401 BERRYSBURG
402 DAUPHIN
403 ELIZABETHVILLE
404 GRATZ
405 HALIFAX
406 HIGHSPIRE
407 HUMMELSTOWN
408 LYKENS
409 MIDDLETOWN
410 MILLERSBURG
411 PAXTANG
412 PENBROOK
413 ROYALTON
414 STEELTON
415 PILLOW
416 WILLIAMSTOWN

Townships, 1st Class:
101 SUSQUEHANNA
102 SWATARA
103 LOWER SWATARA

Townships, 2nd Class:
201 CONEWAGO
202 DERRY
203 EAST HANOVER
204 HALIFAX
205 JACKSON
206 JEFFERSON
207 LONDONDERRY
208 LOWER PAXTON
210 LYKENS
211 MIDDLE PAXTON
212 MIFFLIN
213 REED
214 RUSH
215 SOUTH HANOVER
216 UPPER PAXTON
217 WASHINGTON
218 WAYNE
219 WEST HANOVER
220 WICONISCO
221 WILLIAMS

DELAWARE - 23
District 06-0

Cities:
301 CHESTER

Boroughs:
401 ALDAN
402 BROOKHAVEN
403 CHESTER HEIGHTS
404 CLIFTON HEIGHTS
405 COLLINGDALE
406 COLWYN
407 DARBY
408 EAST LANSDOWNE
409 EDDYSTONE
410 FOLCROFT
411 GLENOLDEN
412 LANSDOWNE
413 MARCUS HOOK
414 MEDIA
415 MILLBOURNE
416 MORTON
417 NORWOOD
418 PARKSIDE
419 PROSPECT PARK
420 RIDLEY PARK
421 ROSE VALLEY
422 RUTLEDGE
423 SHARON HILL
424 SWARTHMORE
425 TRAINER
426 UPLAND
427 YEADON

Townships, 1st Class:
101 ASTON
102 DARBY
103 HAVERFORD
104 LOWER CHICHESTER
105 NETHER PROVIDENCE
106 RADNOR
107 RIDLEY
108 SPRINGFIELD
109 TINICUM
110 UPPER CHICHESTER
111 UPPER DARBY
112 MARPLE

Townships, 2nd Class:
201 BETHEL
202 CHADDS FORD
203 CHESTER
204 CONCORD
205 EDMONT
207 MIDDLETOWN
208 NEWTOWN
209 THORNBURY
210 UPPER PROVIDENCE

ELK - 24
District 02-0

Cities:
301 SAINT MARYS

Boroughs:
401 JOHNSONBURG
402 RIDGWAY

Townships, 2nd Class:
201 BENEZETTE
203 FOX
204 HIGHLAND
205 HORTON
206 JAY
207 JONES
208 MILLSTONE
209 RIDGWAY
210 SPRING CREEK

ERIE - 25
District 01-0

Cities:
301 CORRY
302 ERIE

Boroughs:
401 ALBION
402 CRANESVILLE
404 EDINBORO
405 ELGIN
407 GIRARD
408 LAKE CITY
409 MCKEAN
410 MILL VILLAGE
411 NORTH EAST
412 PLATEA
413 UNION CITY
414 WATERFORD
415 WATTSBURG
416 WESLEYVILLE

Townships, 1st Class:
101 LAWRENCE PARK

Townships, 2nd Class:
201 AMITY
202 CONCORD
203 CONNEAUT
204 ELK CREEK
205 FAIRVIEW
206 FRANKLIN
207 GIRARD
208 GREENE
209 GREENFIELD
210 HARBORCREEK
211 LE BOEUF
212 MCKEAN
213 MILLCREEK
214 NORTH EAST
215 SPRINGFIELD
216 SUMMIT
217 UNION
218 VENANGO
219 WASHINGTON
220 WATERFORD
221 WAYNE

FAYETTE - 26
District 12-0

Cities:
301 CONNELLSVILLE
302 UNIONTOWN

Boroughs:
401 BELLE VERNON
402 BROWNSVILLE
403 DAWSON
404 DUNBAR
405 EVERSON
406 FAIRCHANCE
407 FAYETTE CITY
408 MARKLEYSBURG
409 MASONTOWN
410 NEWELL
411 OHIOPLYLE
412 PERRYOPOLIS
413 POINT MARION
414 SMITHFIELD
415 SOUTH CONNELLSVI
416 VANDERBILT

Townships, 2nd Class:
201 BROWNSVILLE
202 BULLSKIN
203 CONNELLSVILLE

204 DUNBAR
205 FRANKLIN
206 GEORGES
207 GERMAN
208 HENRY CLAY
209 JEFFERSON
210 LOWER TYRONE
211 LUZERNE
212 MENALLEN
213 NICHOLSON
214 NORTH UNION
215 PERRY
216 REDSTONE
217 SALTICK
218 SOUTH UNION
219 SPRINGFIELD
220 SPRINGHILL
221 STEWART
222 UPPER TYRONE
223 WASHINGTON
224 WHARTON

FOREST - 27
District 01-0

Boroughs:
401 TIONESTA

Townships, 2nd Class:
201 BARNETT
202 GREEN
203 HARMONY
204 HICKORY
205 HOWE
206 JENKS
207 KINGSLEY
208 TIONESTA

FRANKLIN - 28
District 08-0

Boroughs:
401 CHAMBERSBURG
402 GREENCASTLE
403 MERCERSBURG
404 MONT ALTO
405 ORRSTOWN
406 WAYNESBORO
409 SHIPPENSBURG

Townships, 2nd Class:
201 ANTRIM
202 FANNETT
203 GREENE
204 GUILFORD
205 HAMILTON
206 LETTERKENNY
207 LURGAN
208 METAL
209 MONTGOMERY
210 PETERS
211 QUINCY
212 SAINT THOMAS
213 SOUTHAMPTON
214 WARREN
215 WASHINGTON

FULTON - 29
District 09-0

Boroughs:
401 MCCONNELLSBURG
402 VALLEY HI

Townships, 2nd Class:
201 AYR
202 BELFAST
203 BETHEL
204 BRUSH CREEK

205 DUBLIN
206 LICKING CREEK
207 TAYLOR
208 THOMPSON
209 TODD
210 UNION
211 WELLS

GREENE - 30
District 12-0

Boroughs:
401 CARMICHAELS
402 CLARKSVILLE
403 GREENSBORO
404 JEFFERSON
405 RICES LANDING
406 WAYNESBURG

Townships, 2nd Class:
201 ALEPPO
202 CENTER
203 CUMBERLAND
204 DUNKARD
205 FRANKLIN
206 FREEPORT
207 GILMORE
208 GRAY
209 GREENE
210 JACKSON
211 JEFFERSON
212 MONONGAHELA
213 MORGAN
214 MORRIS
215 PERRY
216 RICHHILL
217 SPRINGHILL
218 WASHINGTON
219 WAYNE
220 WHITELEY

HUNTINGDON - 31
District 09-0

Boroughs:
401 ALEXANDRIA
402 BIRMINGHAM
403 BROAD TOP CITY
404 CASSVILLE
405 COALMONT
406 DUDLEY
407 HUNTINGDON
408 MAPLETON
409 MARKLESBURG
410 MILL CREEK
411 MOUNT UNION
412 ORBISONIA
413 PETERSBURG
414 ROCKHILL
415 SALTILLO
416 SHADE GAP
417 SHIRLEYSBURG
418 THREE SPRINGS

Townships, 2nd Class:
201 BARREE
202 BRADY
203 CARBON
204 CASS
205 CLAY
206 CROMWELL
207 DUBLIN
208 FRANKLIN
209 HENDERSON
210 HOPEWELL
211 JACKSON
212 JUNIATA
213 LINCOLN

APPENDIX B
Coding for Item 5A06

HUNTINGDON - 31 (cont)
District 09-0

Townships, 2nd Class:
214 LOGAN
215 MILLER
216 MORRIS
217 ONEIDA
218 PENN
219 PORTER
220 SHIRLEY
221 SMITHFIELD
222 SPRINGFIELD
223 SPRUCE CREEK
224 TELL
225 TODD
226 UNION
227 WALKER
228 WARRIORS MARK
229 WEST
230 WOOD

INDIANA - 32
District 10-0

Boroughs:
401 ARMAGH
402 BLAIRSVILLE
403 CHERRY TREE
404 CLYMER
405 CREEKSIDE
406 GLEN CAMPBELL
407 HOMER CITY
408 INDIANA
410 MARION CENTER
411 PLUMVILLE
412 SALTSBURG
413 SHELOCTA
414 SMICKSBURG
415 ERNEST

Townships, 2nd Class:

201 ARMSTRONG
202 BANKS
203 BLACK LICK
204 BRUSH VALLEY
205 BUFFINGTON
206 BURRELL
207 CANOE
208 CENTER
209 CHERRYHILL
210 CONEMAUGH
211 EAST MAHONING
212 EAST WHEATFIELD
213 GRANT
214 GREEN
215 MONTGOMERY
216 NORTH MAHONING
217 PINE
218 RAYNE
219 SOUTH MAHONING
220 WASHINGTON
221 WEST MAHONING
222 WEST WHEATFIELD
223 WHITE
224 YOUNG

JEFFERSON - 33
District 10-0

Boroughs:
401 BIG RUN
402 BROCKWAY
403 BROOKVILLE
404 CORSICA
405 FALLS CREEK
406 PUNXSUTAWNEY

407 REYNOLDSVILLE
408 SUMMERVILLE
409 SYKESVILLE
410 TIMBLIN
411 WORTHVILLE

Townships, 2nd Class:
201 BARNETT
202 BEAVER
203 BELL
204 CLOVER
205 ELDRED
206 GASKILL
207 HEATH
208 HENDERSON
209 KNOX
210 MCCALMONT
211 OLIVER
212 PERRY
213 PINE CREEK
214 POLK
215 PORTER
216 RINGGOLD
217 ROSE
218 SNYDER
219 UNION
220 WARSAW
221 WASHINGTON
222 WINSLOW
223 YOUNG

JUNIATA - 34
District 02-0

Boroughs:
401 MIFFLIN
402 MIFFLINTOWN
403 PORT ROYAL
404 THOMPSONTOWN

Townships, 2nd Class:
201 BEALE
202 DELAWARE
203 FAYETTE
204 FERMANAGH
205 GREENWOOD
206 LACK
207 MILFORD
208 MONROE
209 SPRUCE HILL
210 SUSQUEHANNA
211 TURBETT
212 TUSCARORA
213 WALKER

LACKAWANNA - 35
District 04-0

Cities:
301 CARBONDALE
302 SCRANTON

Boroughs:
401 ARCHBALD
402 BLAKELY
403 CLARKS GREEN
404 CLARKS SUMMIT
405 DALTON
406 DICKSON CITY
407 DUNMORE
408 JERMYN
409 MAYFIELD
410 MOOSIC
411 MOSCOW
412 OLD FORGE
413 OLYPHANT
414 TAYLOR
415 THROOP

416 VANDLING
417 JESSUP

Townships, 2nd Class:
201 WAVERLY
202 BENTON
203 CARBONDALE
204 CLIFTON
205 COVINGTON
206 ELMHURST
207 FELL
208 GLENBURN
209 GREENFIELD
210 JEFFERSON
211 LA PLUME
212 THORNHURST
213 MADISON
214 NEWTON
215 NORTH ABINGTON
216 RANSOM
217 ROARING BROOK
218 SCOTT
219 SOUTH ABINGTON
220 SPRINGBROOK
221 WEST ABINGTON

LANCASTER - 36
District 08-0

Cities:
301 LANCASTER

Boroughs:
401 ADAMSTOWN
402 AKRON
403 CHRISTIANA
404 COLUMBIA
405 DENVER
406 EAST PETERSBURG
407 ELIZABETHTOWN
408 EPHRATA
409 LITITZ
410 MANHEIM
411 MARIETTA
412 MILLERSVILLE
413 MT JOY
414 MOUNTVILLE
415 NEW HOLLAND
416 QUARRYVILLE
417 STRASBURG
418 TERRE HILL

Townships, 1st Class:
101 MANHEIM

Townships, 2nd Class:

201 BART
202 BRECKNOCK
203 CAERNARVON
204 CLAY
205 COLERAIN
206 CONESTOGA
207 CONOY
208 DRUMORE
209 EARL
210 EAST COCALICO
211 EAST DONEGAL
212 EAST DRUMORE
213 EAST EARL
214 EAST HEMPFIELD
215 EAST LAMPETER
216 EDEN
217 ELIZABETH
218 EPHRATA
219 FULTON
220 LANCASTER
221 LEACOCK
222 LITTLE BRITAIN

223 MANOR
224 MARTIC
225 MOUNT JOY
226 PARADISE
227 PENN
228 PEQUEA
229 PROVIDENCE
230 RAPHO
231 SADSBUY
232 SALISBURY
233 STRASBURG
234 UPPER LEACOCK
235 WARWICK
236 WEST COCALICO
237 WEST DONEGAL
238 WEST EARL
239 WEST HEMPFIELD
240 WEST LAMPETER

LAWRENCE - 37
District 11-0

Cities:
301 NEW CASTLE

Boroughs:

401 BESSEMER
402 ELLPORT
403 ELLWOOD CITY
404 ENON VALLEY
405 NEW WILMINGTON
406 SOUTH NEW CASTLE
408 WAMPUM
409 NEW BEAVER
410 S.N.P.J.
XXX Volant

Townships, 2nd Class:
202 HICKORY
203 LITTLE BEAVER
204 MAHONING
205 NESHANNOCK
206 NORTH BEAVER
207 PERRY
208 PLAIN GROVE
209 PULASKI
210 SCOTT
211 SHENANGO
212 SLIPPERY ROCK
213 TAYLOR
214 UNION
215 WASHINGTON
216 WAYNE
217 WILMINGTON

LEBANON - 38
District 08-0

Cities:
301 LEBANON

Boroughs:

401 CLEONA
402 CORNWALL
403 JONESTOWN
404 MOUNT GRETNA
405 MYERSTOWN
406 PALMYRA
407 RICHLAND

Townships, 1st Class:
101 ANNVILLE
102 WEST LEBANON

Townships, 2nd Class:
201 BETHEL
202 COLD SPRING
203 EAST HANOVER
204 HEIDELBERG

205 JACKSON
206 MILLCREEK
207 NORTH ANNVILLE
208 NORTH CORNWALL
209 NORTH LEBANON
210 NORTH LONDONDER
211 SOUTH ANNVILLE
212 SOUTH LEBANON
213 SOUTH LONDONDER
214 SWATARA
215 UNION
216 WEST CORNWALL

LEHIGH - 39
District 05-0

Cities:
301 ALLENTOWN
302 BETHLEHEM

Boroughs:

401 ALBURTIS
402 CATASAUQUA
403 COOPERSBURG
404 COPLAY
405 EMMAUS
406 FOUNTAIN HILL
407 MACUNGIE
408 SLATINGTON

Townships, 1st Class:

101 SALISBURY
102 WHITEHALL
103 SOUTH WHITEHALL
104 LOWER MACUNGIE

Townships, 2nd Class:

201 HANOVER
202 HEIDELBERG
204 LOWER MILFORD
205 LOWHILL
206 LYNN
207 NORTH WHITEHALL
209 UPPER MACUNGIE
210 UPPER MILFORD
211 UPPER SAUCON
212 WASHINGTON
213 WEISENBERG

LUZERNE - 40
District 04-0

Cities:
301 HAZLETON
302 NANTICOKE
303 PITTSSTON
304 WILKES BARRE

Boroughs:

401 ASHLEY
402 AVOCA
403 CONYNGHAM
404 COURTDALE
405 DALLAS
406 DUPONT
407 DURVEA
408 EDWARDSVILLE
409 EXETER
410 FORTY FORT
411 FREELAND
412 HUGHESTOWN
413 JEDDO
414 KINGSTON
415 LAFLIN
416 LARKSVILLE
417 LAUREL RUN
418 LUZERNE
419 NESCOPECK

APPENDIX B
Coding for Item 5A06

LUZERNE - 40 (cont)
District 04-0

Boroughs:
420 NEW COLUMBUS
421 NUANGOLA
422 PLYMOUTH
423 PRINGLE
424 SHICKSHINNY
425 SUGAR NOTCH
426 SWOYERSVILLE
427 WARRIOR RUN
428 WEST HAZLETON
429 WEST PITSTON
430 WEST WYOMING
431 WHITE HAVEN
432 WYOMING
433 YATESVILLE
434 HARVEYS LAKE
435 PENN LAKE PARK
436 BEAR CREEK VILLAG

Townships, 1st Class:
101 HANOVER
102 NEWPORT
103 PLAINS
104 WILKES BARRE

Townships, 2nd Class:
201 BEAR CREEK
202 BLACK CREEK
203 BUCK
204 BUTLER
205 CONYNGHAM
206 DALLAS
207 DENNISON
208 DORRANCE
209 EXETER
210 FAIRMOUNT
211 FAIRVIEW
212 FOSTER
213 FRANKLIN
214 HAZLE
215 HOLLENBACK
216 HUNLOCK
217 HUNTINGTON
218 JACKSON
219 JENKINS
220 KINGSTON
221 LAKE
222 LEHMAN
223 NESCOPECK
224 PITSTON
225 PLYMOUTH
226 RICE
227 ROSS
228 SALEM
229 SLOCUM
230 SUGARLOAF
231 UNION
232 WRIGHT

LYCOMING - 41
District 03-0

Cities:
301 WILLIAMSPORT

Boroughs:
401 DUBOISTOWN
402 HUGHESVILLE
403 JERSEY SHORE
404 MONTGOMERY
405 MONTOURSVILLE
406 MUNCY
407 PICTURE ROCKS
408 SALLADASBURG
409 SOUTH WILLIAMSPOR

Townships, 2nd Class:
201 ANTHONY
202 ARMSTRONG
203 BASTRESS
204 BRADY
205 BROWN
206 CASCADE
207 CLINTON
208 COGAN HOUSE
209 CUMMINGS
210 ELDRED
211 FAIRFIELD
212 FRANKLIN
213 GAMBLE
214 HEPBURN
215 JACKSON
216 JORDAN
217 LEWIS
218 LIMESTONE
219 LOYALSOCK
220 LYCOMING
221 MCHENRY
222 MCINTYRE
223 MCNETT
224 MIFFLIN
225 MILL CREEK
226 MORELAND
227 MUNCY
228 MUNCY CREEK
229 NIPPENOSE
230 OLD LYCOMING
231 PENN
232 PIATT
233 PINE
234 PLUNKETTS CREEK
235 PORTER
236 SHREWSBURY
237 SUSQUEHANNA
238 UPPER FAIRFIELD
239 WASHINGTON
240 WATSON
241 WOLF
242 WOODWARD

McKEAN - 42
District 02-0

Cities:
301 BRADFORD

Boroughs:
401 ELDRED
402 KANE
403 LEWIS RUN
404 MOUNT JEWETT
405 PORT ALLEGANY
406 SMETHPORT

Townships, 2nd Class:
201 ANNIN
202 BRADFORD
203 CERES
204 CORYDON
205 ELDRED
206 FOSTER
207 HAMILTON
208 HAMLIN
209 KEATING
210 LAFAYETTE
211 LIBERTY
212 NORWICH
213 OTTO
214 SERGEANT
215 WETMORE

MERCER - 43
District 01-0

Cities:
301 FARRELL
302 SHARON
303 HERMITAGE

Boroughs:
401 CLARK
402 FREDONIA
403 GREENVILLE
404 GROVE CITY
405 JACKSON CENTER
406 JAMESTOWN
407 MERCER
408 NEW LEBANON
409 SANDY LAKE
410 SHARPSVILLE
411 SHEAKLEYVILLE
412 STONEBORO
413 WEST MIDDLESEX
414 WHEATLAND

Townships, 2nd Class:
201 COOLSPRING
202 DEER CREEK
203 DELAWARE
204 EAST LACKAWANNO
205 FAIRVIEW
206 FINDLEY
207 FRENCH CREEK
208 GREENE
209 HEMPFIELD
210 JACKSON
211 JEFFERSON
212 LACKAWANNOCK
213 LAKE
214 LIBERTY
215 MILL CREEK
216 NEW VERNON
217 OTTER CREEK
218 PERRY
219 PINE
220 PYMATUNING
221 SALEM
222 SANDY CREEK
223 SANDY LAKE
224 SHENANGO
225 SOUTH PYMATUNING
226 SPRINGFIELD
227 SUGAR GROVE
228 WEST SALEM
229 WILMINGTON
230 WOLF CREEK
231 WORTH

Mifflin - 44
District 02-0

Boroughs:
401 BURNHAM
402 KISTLER
403 LEWISTOWN
404 MCVEYTOWN
405 NEWTON HAMILTON
406 JUNIATA TERRACE

Townships, 2nd Class:
201 ARMAGH
202 BRATTON
203 BROWN
204 DECATUR
205 DERRY
206 GRANVILLE
207 MENNO
208 OLIVER

209 UNION
210 WAYNE

MONROE - 45
District 05-0

Boroughs:
401 DELAWARE WATER
402 EAST STROUDSBURG
403 MOUNT POCONO
404 STROUDSBURG

Townships, 2nd Class:
201 BARRETT
202 CHESTNUTHILL
203 COOLBAUGH
204 ELDRED
205 HAMILTON
206 JACKSON
207 MIDDLE SMITHFIELD
208 PARADISE
209 POCONO
210 POLK
211 PRICE
212 ROSS
213 SMITHFIELD
214 STROUD
215 TOBYHANNA
216 TUNKHANNOCK

MONTGOMERY - 46
District 06-0

Boroughs:
401 AMBLER
402 BRIDGEPORT
403 BRYN ATHYN
404 COLLEGEVILLE
405 CONSHOHOCKEN
406 EAST GREENVILLE
407 GREEN LANE
408 HATBORO
409 HATFIELD
410 JENKINTOWN
411 LANSDALE
412 NARBERTH
413 NORRISTOWN
414 NORTH WALES
415 PENNSBURG
416 POTTSTOWN
417 RED HILL
418 ROCKLEDGE
419 ROYERSFORD
420 SCHWENKSVILLE
421 SOUDERTON
422 TELFORD
423 TRAPPE
424 WEST CONSHOHOCK

Townships, 1st Class:
101 ABINGTON
102 CHELTENHAM
103 HATFIELD
104 LOWER MERION
105 LOWER MORELAND
106 LOWER POTTS GROVE
107 PLYMOUTH
108 SPRINGFIELD
109 UPPER DUBLIN
110 UPPER MORELAND
111 WEST NORRITON
112 WEST POTTS GROVE
113 UPPER GWYNEDD
114 UPPER POTTS GROVE

Townships, 2nd Class:
201 DOUGLASS
202 EAST NORRITON

203 FRANCONIA
204 HORSHAM
205 LIMERICK
206 LOWER FREDERICK
207 LOWER GWYNEDD
208 LOWER PROVIDENCE
209 LOWER SALFORD
210 MARLBOROUGH
211 MONTGOMERY
212 NEW HANOVER
213 PERKIOMEN
214 SALFORD
215 SKIPPACK
216 TOWAMENCIN
217 UPPER FREDERICK
219 UPPER HANOVER
220 UPPER MERION
222 UPPER PROVIDENCE
223 UPPER SALFORD
224 WHITEMARSH
225 WHITPAIN
226 WORCESTER

MONTOUR - 47
District 03-0

Boroughs:
401 DANVILLE
402 WASHINGTONVILLE

Townships, 2nd Class:
201 ANTHONY
202 COOPER
203 DERRY
204 LIBERTY
205 LIMESTONE
206 MAHONING
207 MAYBERRY
208 VALLEY
209 WEST HEMLOCK

NORTHAMPTON - 48
District 05-0

Cities:
301 BETHLEHEM
302 EASTON

Boroughs:
401 BANGOR
402 BATH
403 CHAPMAN
404 EAST BANGOR
405 FREEMANSBURG
406 GLENDON
407 HELLERTOWN
408 NAZARETH
409 NORTHAMPTON
410 NORTH CATASAUQU
411 PEN ARGYL
412 PORTLAND
413 ROSETO
414 STOCKERTOWN
415 TATAMY
416 WALNUTPORT
417 WEST EASTON
418 WILSON
419 WIND GAP

Townships, 1st Class:
101 BETHLEHEM

Townships, 2nd Class:
201 ALLEN
203 BUSHKILL
204 EAST ALLEN
205 FORKS
206 HANOVER

APPENDIX B
Coding for Item 5A06

NORTHAMPTON - 48 (cont)
District 05-0

Townships, 2nd Class:
207 LEHIGH
208 LOWER MT BETHEL
209 LOWER NAZARETH
210 LOWER SAUCON
211 MOORE
212 PALMER
213 PLAINFIELD
214 UPPER MT BETHEL
215 UPPER NAZARETH
216 WASHINGTON
217 WILLIAMS

NORTHUMBERLAND - 49
District 03-0

Cities:
301 SHAMOKIN
302 SUNBURY

Boroughs:
401 HERNDON
402 KULPMONT
403 MARION HEIGHTS
404 MCEWENSVILLE
405 MILTON
406 MOUNT CARMEL
407 NORTHUMBERLAND
408 RIVERSIDE
409 SNYDERTOWN
410 TURBOTVILLE
411 WATSONTOWN

Townships, 1st Class:
101 COAL

Townships, 2nd Class:
201 DELAWARE
202 EAST CAMERON
203 EAST CHILLISQUAQU
204 JACKSON
205 JORDAN
206 LEWIS
207 LITTLE MAHANOEY
208 LOWER AUGUSTA
209 LOWER MAHANOEY
210 MOUNT CARMEL
211 POINT
212 RALPHO
213 ROCKEFELLER
214 RUSH
215 SHAMOKIN
216 TURBOT
217 UPPER AUGUSTA
218 UPPER MAHANOEY
219 WASHINGTON
220 WEST CAMERON
221 WEST CHILLISQUAQU
222 ZERBE

PERRY - 50
District 08-0

Boroughs:
401 BLAIN
402 BLOOMFIELD
403 DUNCANNON
404 LANDISBURG
405 LIVERPOOL
406 MARYSVILLE
407 MILLERSTOWN
408 NEW BUFFALO
409 NEWPORT

Townships, 2nd Class:
201 BUFFALO
202 CARROLL
203 CENTRE
204 GREENWOOD
205 HOWE
206 JACKSON
207 JUNIATA
208 LIVERPOOL
209 MILLER
210 NORTHEAST MADISO
211 OLIVER
212 PENN
213 RYE
214 SAVILLE
215 SOUTHWEST MADISO
216 SPRING
217 TOBOYNE
218 TUSCARORA
219 TYRONE
220 WATTS
221 WHEATFIELD

PIKE - 51
District 04-0

Boroughs:
401 MATAMORAS
402 MILFORD

Townships, 2nd Class:
201 BLOOMING GROVE
202 DELAWARE
203 DINGMAN
204 GREENE
205 LACKAWAXEN
206 LEHMAN
207 MILFORD
208 PALMYRA
209 PORTER
210 SHOHLA
211 WESTFALL

POTTER - 52
District 02-0

Boroughs:
401 AUSTIN
402 COUDERSPORT
403 GALETON
404 ULYSSES
405 OSWAYO
406 SHINGLEHOUSE

Townships, 2nd Class:
201 ABBOTT
202 ALLEGANY
203 BINGHAM
204 CLARA
205 EAST FORK
206 EULALIA
207 GENESEE
208 HARRISON
209 HEBRON
210 HECTOR
211 HOMER
212 KEATING
213 OSWAYO
214 PIKE
215 PLEASANT VALLEY
216 PORTAGE
217 ROULETTE
218 SHARON
219 STEWARDSON
220 SUMMIT
221 SWEDEN
222 SYLVANIA
223 ULYSSES

224 WEST BRANCH
225 WHARTON

SCHUYLKILL - 53
District 05-0

Cities:
301 POTTSVILLE

Boroughs:
401 ASHLAND
402 AUBURN
403 COALDALE
404 CRESSONA
405 DEER LAKE
406 FRACKVILLE
407 GILBERTON
408 GIRARDVILLE
409 GORDON
410 LANDINGVILLE
411 MAHANOEY CITY
412 MCADOO
413 MECHANICSVILLE
414 MIDDLEPORT
415 MINERSVILLE
416 MOUNT CARBON
417 NEW PHILADELPHIA
418 NEW RINGGOLD
419 ORWIGSBURG
420 PALO ALTO
421 PINE GROVE
422 PORT CARBON
423 PORT CLINTON
424 RINGTOWN
425 SAINT CLAIR
426 SCHUYLKILL HAVEN
427 SHENANDOAH
428 TAMAQUA
429 TOWER CITY
430 TREMONT

Townships, 2nd Class:
201 BARRY
202 BLYTHE
203 BRANCH
204 BUTLER
205 CASS
206 DELANO
207 EAST BRUNSWICK
208 EAST NORWEGIAN
209 EAST UNION
210 ELDRED
211 FOSTER
212 FRAILEY
213 HEGINS
214 HUBLEY
215 KLINE
216 MAHANOEY
217 NEW CASTLE
218 NORTH MANHEIM
219 NORTH UNION
220 NORWEGIAN
221 PINE GROVE
222 PORTER
224 REILLY
225 RUSH
226 RYAN
227 SCHUYLKILL
228 SOUTH MANHEIM
229 TREMONT
230 UNION
231 UPPER MAHANTONG
232 WALKER
233 WASHINGTON
234 WAYNE
235 WEST BRUNSWICK
236 WEST MAHANOEY
237 WEST PENN

SNYDER - 54
District 03-0

Boroughs:
401 BEAVERTOWN
402 FREEBURG
403 MIDDLEBURG
404 SELINGSGROVE
405 SHAMOKIN DAM
406 MCCLURE

Townships, 2nd Class:
201 ADAMS
202 BEAVER
203 CENTER
204 CHAPMAN
205 FRANKLIN
206 JACKSON
207 MIDDLE CREEK
208 MONROE
209 PENN
210 PERRY
211 SPRING
212 UNION
213 WASHINGTON
214 WEST BEAVER
215 WEST PERRY

SOMERSET - 55
District 09-0

Boroughs:
401 ADDISON
402 BENSON
403 BERLIN
404 BOSWELL
405 CASSELMAN
406 CENTRAL CITY
407 CONFLUENCE
408 GARRETT
409 HOOVERSVILLE
410 JENNERSTOWN
411 MEYERSDALE
412 NEW BALTIMORE
413 NEW CENTERVILLE
414 PAINT
415 ROCKWOOD
416 SALISBURY
417 SHANKSVILLE
418 SOMERSET
419 STOYSTOWN
420 URSINA
421 WELLERSBURG
422 WINDBER
423 SEVEN SPRINGS
424 INDIAN LAKE
425 CALLIMONT

Townships, 2nd Class:
201 ADDISON
202 ALLEGHENY
203 BLACK
204 BROTHERS VALLEY
205 CONEMAUGH
206 ELK LICK
207 FAIRHOPE
208 GREENVILLE
209 JEFFERSON
210 JENNER
211 LARIMER
212 LINCOLN
213 LOWER TURKEYFOOT
214 MIDDLECREEK
215 MILFORD
216 NORTHAMPTON
217 OGLE
218 PAINT
219 QUEMAHONING

220 SHADE
221 SOMERSET
222 SOUTHAMPTON
223 STONYCREEK
224 SUMMIT
225 UPPER TURKEYFOOT

SULLIVAN - 56
District 03-0

Boroughs:
401 DUSHORE
402 EAGLES MERE
403 FARKSVILLE
404 LAPORTE

Townships, 2nd Class:
201 CHERRY
202 COLLEY
203 DAVIDSON
204 ELKLAND
205 FORKS
206 FOX
207 HILLSGROVE
208 LAPORTE
209 SHREWSBURY

SUSQUEHANNA - 57
District 04-0

Boroughs:
401 FOREST CITY
402 FRIENDSVILLE
403 GREAT BEND
404 HALLSTEAD
405 HOP BOTTOM
406 LANESBORO
407 LITTLE MEADOWS
408 MONTROSE
409 NEW MILFORD
410 OAKLAND
411 SUSQUEHANNA DEP
412 THOMPSON
413 UNION DALE

Townships, 2nd Class:
201 APOLACON
202 ARARAT
203 AUBURN
204 BRIDGEWATER
205 BROOKLYN
206 CHOCONUT
207 CLIFFORD
208 DIMOCK
209 FOREST LAKE
210 FRANKLIN
211 GIBSON
212 GREAT BEND
213 HARFORD
214 HARMONY
215 HERRICK
216 JACKSON
217 JESSUP
218 LATHROP
219 LENOX
220 LIBERTY
221 MIDDLETOWN
222 NEW MILFORD
223 OAKLAND
224 RUSH
225 SILVER LAKE
226 SPRINGVILLE
227 THOMPSON

APPENDIX B
Coding for Item 5A06

TIOGA - 58
District 03-0

- Boroughs:
- 401 BLOSSBURG
 - 402 ELKLAND
 - 403 KNOXVILLE
 - 404 LAWRENCEVILLE
 - 405 LIBERTY
 - 406 MANSFIELD
 - 407 ROSEVILLE
 - 408 TIOGA
 - 409 WELLSBORO
 - 410 WESTFIELD

Townships, 2nd Class:

- 201 BLOSS
- 202 BROOKFIELD
- 203 CHARLESTON
- 204 CHATHAM
- 205 CLYMER
- 206 COVINGTON
- 207 DEERFIELD
- 208 DELMAR
- 209 DUNCAN
- 210 ELK
- 212 FARMINGTON
- 213 GAINES
- 214 HAMILTON
- 215 JACKSON
- 216 LAWRENCE
- 217 LIBERTY
- 218 MIDDLEBURY
- 219 MORRIS
- 220 NELSON
- 221 OSCEOLA
- 222 PUTNAM
- 223 RICHMOND
- 224 RUTLAND
- 225 SHIPPEN
- 226 SULLIVAN
- 227 TIOGA
- 228 UNION
- 229 WARD
- 230 WESTFIELD

UNION - 59
District 03-0

- Boroughs:
- 401 HARTLETON
 - 402 LEWISBURG
 - 403 MIFFLINBURG
 - 404 NEW BERLIN

Townships, 2nd Class:

- 201 BUFFALO
- 202 EAST BUFFALO
- 203 GREGG
- 204 HARTLEY
- 205 KELLY
- 206 LEWIS
- 207 LIMESTONE
- 208 UNION
- 209 WEST BUFFALO
- 210 WHITE DEER

VENANGO - 60
District 01-0

- Cities:
- 301 FRANKLIN
 - 302 OIL CITY

Boroughs:

- 401 CLINTONVILLE
- 402 COOPERSTOWN
- 403 EMLENTON

- 404 PLEASANTVILLE
- 405 POLK
- 406 ROUSEVILLE
- 407 UTICA
- 408 BARKEYVILLE
- 409 SUGARCREEK

Townships, 2nd Class:

- 201 ALLEGHENY
- 202 CANAL
- 203 CHERRYTREE
- 204 CLINTON
- 205 CORNPLANTER
- 206 CRANBERRY
- 207 FRENCH CREEK
- 208 IRWIN
- 209 JACKSON
- 210 MINERAL
- 211 OAKLAND
- 212 OIL CREEK
- 213 PINE GROVE
- 214 PLUM
- 215 PRESIDENT
- 216 RICHLAND
- 217 ROCKLAND
- 218 SANDY CREEK
- 219 SCRUBGRASS
- 220 VICTORY

WARREN - 61

District 01-0

Cities:

- 301 WARREN

Boroughs:

- 401 BEAR LAKE
- 402 CLARENDON
- 403 SUGARGROVE
- 404 TIDIOUTE
- 406 YOUNGSVILLE

Townships, 2nd Class:

- 201 BROKENSTRAW
- 202 CHERRY GROVE
- 203 COLUMBUS
- 204 CONEWANGO
- 206 DEERFIELD
- 207 ELDRED
- 208 ELK
- 209 FARMINGTON
- 210 FREEHOLD
- 211 GLADE
- 213 LIMESTONE
- 214 MEAD
- 215 PINE GROVE
- 216 PITTSFIELD
- 217 PLEASANT
- 218 SHEFFIELD
- 219 SOUTHWEST
- 220 SPRING CREEK
- 221 SUGAR GROVE
- 222 TRIUMPH
- 223 WATSON

WASHINGTON - 62

District 12-0

Cities:

- 301 MONONGAHELA
- 302 WASHINGTON

Boroughs:

- 401 ALLENPORT
- 402 BEALLSVILLE
- 403 BENTLEYVILLE
- 404 BURGETTSTOWN
- 405 CALIFORNIA

406 CANONSBURG

- 407 CENTERVILLE
- 408 CHARLEROI
- 409 CLAYSVILLE
- 410 COAL CENTER
- 411 COKEBURG
- 412 DEEMSTON
- 413 DONORA
- 414 DUNLEVY
- 415 EAST WASHINGTON
- 416 ELCO
- 417 ELLSWORTH
- 418 FINLEYVILLE
- 419 HOUSTON
- 420 LONG BRANCH
- 421 MARIANNA
- 422 MCDONALD
- 423 MIDWAY
- 424 NEW EAGLE
- 425 NORTH CHARLEROI
- 426 ROSCOE
- 427 SPEERS
- 428 STOCKDALE
- 429 TWILIGHT
- 430 WEST ALEXANDER
- 431 WEST BROWNSVILLE
- 432 WEST MIDDLETOWN
- 433 GREENHILLS

Townships, 2nd Class:

- 201 BERLIN
- 202 BUCKINGHAM
- 203 CANAAN
- 204 CHERRY RIDGE
- 205 CLINTON
- 206 DAMASCUS
- 207 DREHER
- 208 DYBERRY
- 209 LAKE
- 210 LEBANON
- 211 LEHIGH
- 212 MANCHESTER
- 213 MOUNT PLEASANT
- 214 OREGON
- 215 PALMYRA
- 216 PAUPACK
- 217 PRESTON
- 218 SALEM
- 219 SCOTT
- 220 SOUTH CANAAN
- 221 STERLING
- 222 TEXAS

WESTMORELAND - 64

District 12-0

Cities:

- 301 ARNOLD
- 302 GREENSBURG
- 303 JEANNETTE
- 304 MONESSEN
- 305 NEW KENSINGTON
- 306 LOWER BURRELL

Boroughs:

- 401 ADAMSBURG
- 402 ARONA
- 403 AVONMORE
- 404 BOLIVAR
- 405 DERRY
- 406 DONEGAL
- 407 EAST VANDERGRIFT
- 408 EXPORT
- 409 HUNKER
- 410 HYDE PARK
- 411 IRWIN
- 412 LATROBE
- 413 LIGONIER
- 414 MADISON
- 415 MANOR
- 416 MOUNT PLEASANT
- 417 NEW ALEXANDRIA
- 418 NEW FLORENCE
- 419 DELMONT
- 420 NORTH BELLE VERO
- 421 NORTH IRWIN
- 422 OKLAHOMA
- 423 PENN
- 424 SCOTTDALE
- 425 SEWARD
- 426 SMITHTON
- 427 SOUTH GREENSBURG
- 428 SOUTHWEST GREEN
- 429 SUTERSVILLE
- 430 TRAFFORD
- 431 VANDERGRIFT
- 432 WEST LEECHBURG
- 433 WEST NEWTON
- 434 YOUNGSTOWN
- 435 YOUNGWOOD
- 436 NEW STANTON
- 437 MURRYSVILLE
- 438 LAUREL MOUNTAIN

Townships, 2nd Class:

- 201 BRAINTRIM
- 202 CLINTON
- 203 EATON
- 204 EXETER
- 205 FALLS
- 206 FORKSTON
- 207 LEMON
- 208 MEHOOPANY
- 209 MESHOPPEN
- 210 MONROE
- 211 NICHOLSON
- 212 NORTH BRANCH
- 213 NORTHMORELAND
- 214 NOXEN
- 215 OVERFIELD
- 216 TUNKHANNOCK
- 217 WASHINGTON
- 218 WINDHAM

Townships, 1st Class:

- 101 NORTH HUNTINGDON
- 102 PENN
- 103 ROSTRAVER

Townships, 2nd Class:

- 201 ALLEGHENY
- 202 BELL
- 203 COOK
- 204 DERRY
- 205 DONEGAL
- 206 EAST HUNTINGTON
- 207 FAIRFIELD
- 209 HEMPFIELD
- 210 LIGONIER
- 211 LOYALHANNA
- 212 MOUNT PLEASANT
- 213 ST CLAIR
- 214 SALEM
- 215 SEWICKLEY
- 216 SOUTH HUNTINGDON
- 217 UNITY
- 218 UPPER BURRELL
- 219 WASHINGTON

WYOMING - 65

District 04-0

Boroughs:

- 401 FACTORYVILLE
- 402 LACEYVILLE
- 403 MESHOPPEN
- 404 NICHOLSON
- 405 TUNKHANNOCK

Townships, 2nd Class:

- 201 BRAINTRIM
- 202 CLINTON
- 203 EATON
- 204 EXETER
- 205 FALLS
- 206 FORKSTON
- 207 LEMON
- 208 MEHOOPANY
- 209 MESHOPPEN
- 210 MONROE
- 211 NICHOLSON
- 212 NORTH BRANCH
- 213 NORTHMORELAND
- 214 NOXEN
- 215 OVERFIELD
- 216 TUNKHANNOCK
- 217 WASHINGTON
- 218 WINDHAM

YORK - 66

District 08-0

Cities:

- 301 YORK

Boroughs:

- 401 CROSS ROADS
- 402 DALLASTOWN
- 403 DELTA
- 404 DILLSBURG
- 405 DOVER
- 406 EAST PROSPECT
- 407 FAWN GROVE
- 408 FELTON
- 409 FRANKLINTOWN
- 410 GLEN ROCK
- 411 GOLDSBORO
- 412 HALLAM
- 413 HANOVER

APPENDIX B
Coding for Item 5A06

YORK - 66 (cont)
District 08-0

Boroughs:

414 JACOBUS
415 JEFFERSON
416 LEWISBERRY
417 LOGANVILLE
418 MANCHESTER
419 MOUNT WOLF
420 NEW FREEDOM
421 NEW SALEM
422 NORTH YORK
423 RAILROAD
424 RED LION
425 SEVEN VALLEYS
426 SHREWSBURY
427 SPRING GROVE
428 STEWARTSTOWN
429 WELLSVILLE
430 WEST YORK
431 WINDSOR
432 WINTERSTOWN
433 WRIGHTSVILLE
434 YOE
435 YORKANA
436 YORK HAVEN

Townships, 1st Class:

101 SPRING GARDEN
102 YORK
103 PENN

Townships, 2nd Class:

201 CARROLL
202 CHANCEFORD
203 CODORUS
204 CONEWAGO
205 DOVER
206 EAST HOPEWELL
207 EAST MANCHESTER
208 FAIRVIEW
209 FAWN
210 FRANKLIN
211 HEIDELBERG
212 HELLAM
213 HOPEWELL
214 JACKSON
215 LOWER CHANCEFOR
216 LOWER WINDSOR
217 MANCHESTER
218 MANHEIM
219 MONAGHAN
220 NEWBERRY
221 NORTH CODORUS
222 NORTH HOPEWELL
223 PARADISE
224 PEACH BOTTOM
226 SHREWSBURY
227 SPRINGETTSBURY
228 SPRINGFIELD
229 WARRINGTON
230 WASHINGTON
231 WEST MANCHESTER
232 WEST MANHEIM
233 WINDSOR

PHILADELPHIA - 67
District 06-0

Cities:

301 PHILADELPHIA

APPENDIX B
Coding for Item 5A06

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Appendix C

BMS2, BMS and FHWA Item Conversion Chart

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APPENDIX C
BMS to BMS2 Conversion Chart

BMSCode	BMS2Code	BMS2 Link	Description	FHWA
A01	5A01		Structure Identification Number	8
A01	5A01		Structure Identification Number	5D
A01	5A05		County Code	3
A01	VW21		Wall Location - Begin and End	
A01	VW22		State Route Number - Begin and End	
A01	VW23		Segment Designation - Begin and End	
A01	VW24		Offset - Begin and End	
A02	6A01		State Senatorial District	
A03	6A02		United States Congressional District	
A04	6A03		Legislative District	
A04A	5A12		Name of Border State/FHWA Region/Share Percentage	98A
A04B	5A12		Name of Border State/FHWA Region/Share Percentage	98B
A04C	5A13		Border Bridge Structure Number	99
A05	6A06		Agency Submitting Structure Inventory Record	
A06	5A02		Structure Name	9
A06	5A09		Location of Structure	9
A07	5A10		Latitude of Bridge Location	16
A08	5A11		Longitude of Bridge Location	17
A09	5A06		City/Town/Placecode	4
A10	6A04		County or Municipal Boundary Intersecting Bridge	
A12	6A07		Federal Funding Code	
A12A	VN01		Design Exception Codes	
A13	VM05		PUC Docket Number	
A14	VN05		Design Drawing Numbers	
A15	VN06		Shop Drawing Numbers	
A16	5A15		Year the Bridge Was Built	27
A17	5A16		Year of Last Major Reconstruction on the Bridge	106
A17	VS10		Not Used - Reserved for Future Use	
A17	VW14		Not Used - Reserved for Future Use	
A18	5C30		School Bus Route	
A19	5C32		Transit Bus Route	
A20	5A21		Owner or Principal Custodian of the Bridge	22
A20	6A23		Owner Description	22
A21	VM01		Legislative Act Number which Transferred Ownership	
A22	VM02		Maintenance Responsibility for the Bridge	21
A23	5A20	VM03, VM04	Maintenance Responsibility for Bridge	
A23	VM03		Agency Responsible for Bridge Maintenance	21
A23	VM04		Portion of Bridge	21
A25	5C21		Toll Facility	20
A26	5A17		Type of Service On Bridge	42A
A26	5A18		Type of Service Under Bridge	42B
A27	5E03		Temporary Structure	103
A28	6A09		Critical Facility	
A29	6A43		Width of Pavement on the Approach to the Bridge	
A30	5C26		Width of Approach to the Bridge	32
A31	5C27		Bridge Roadway Width, Curb to Curb	51
A32	5B10		Is the Structure Flared?	35
A33	5B07		Out-to-Out Width of the Bridge Deck	52
A34	5B05		Curb / Sidewalk Width on Left	50A
A34	5B06		Curb / Sidewalk Width on Right	50B
A34	VI05		Left Sidewalk Type	
A34	VI06		Right Sidewalk Type	
A34	VI07	5B05	Left Sidewalk Width	
A34	VI08	5B06	Right Sidewalk Width	
A35	5C15		Bypass Detour Length	19
A36	VI09		Is the Bridge on a Horizontal Curve?	
A36	VI10		Is the Bridge on a Vertical Curve?	
A37	5A14		FIPS State / Region	1
AL Screen	2A01		Structure Notes	
B01	5C03		Position/Prefix - Is the Feature Intersected On or Under the Bridge?	5A
B01	FR02		Not Used - Reserved for Future Use	
B02	6C02		State Route Number - State Roadway Location	5D
B02	6C03		Segment - State Roadway Location	
B03	5C01		Road / Route Name	
B03	FW01		Name of the Stream (Creek, River, etc.)	
B04	5C03		Position/Prefix - Is the Feature Intersected On or Under the Bridge?	5A
B05	5C06		State Traffic Route / Suffix	5D
B06	5C06		State Traffic Route / Suffix	5E
B07	5C04		Route Signing Prefix	5B
B08	5C05		Designated Level of Service	5C
B09	5B09		Skew Angle	34
B10	5B08	6C25	Median Type	33
B10	5E02		Parallel Structure	101
B10	6C25		Median Type	33
B10	6C26		Median Width	
B11	5A19	5C08	Lanes Under the Structure	28B
B11	5C08		Lanes On and Under the Structure / Medians on Structure / Speed	28A
B11	FR07		Total Number of Railroad Tracks	
B11	VS29		Not Used - Reserved for Future Use	

**APPENDIX C
BMS to BMS2 Conversion Chart**

BMSCode	BMS2Code	BMS2 Link	Description	FHWA
B12	FR06		Number of Electrified Railroad Tracks	
B13	FR01		Name of Railroad	
B13	FR03		Service Status of Railroad	
B14	FR05		Association of American Railroads Identifying Number	
B15	FR04		Railroad Milepost	
B16	6C05		Administrative Jurisdiction	
B17	6C10		Highway System	
B17A	5C29		National Highway System	104
B17A	6C15		RMS NHS Indicator	
B18	5C22		Functional Classification	26
B18	IL04		Functional Classification	
B19	6C11		State Highway Network	
B19A	5C33		National Truck Network	110
B20	4A19		Minimum Lateral Underclearance on the Right Side	55B
B20	4A20		Minimum Lateral Underclearance on the Left Side	56
B21	6C18		Total Horizontal Clearance for the Left Roadway	47
B21	6C19		Total Horizontal Clearance for the Right Roadway	47
B21	FR12		Total Horizontal Clearance for the Left Roadway	47
B21	FR13		Total Horizontal Clearance for the Right Roadway	47
B22	4A15	6C20, 6C21	Minimum Vertical Clearance Over Bridge Roadway	53
B22	4A17	6C20, 6C21	Minimum Vertical Underclearance	54B
B22	6C20		Minimum Vertical Clearance for the Left Roadway	54
B22	6C21		Minimum Vertical Clearance for the Right Roadway	54
B22	FR10		Minimum Vertical Clearance for the Left Roadway	54
B22	FR11		Minimum Vertical Clearance for the Right Roadway	54
B23	5C24	6C22, 6C23	Vertical Clearance Over 10 Ft Width (Defense Highways)	
B23	6C22		Vertical Clearance Over 10 Ft Width (Defense Highways) for Left Roadway	
B23	6C23		Vertical Clearance Over 10 Ft Width (Defense Highways) for Right Roadway	
B23	FR14		Vertical Clearance Over 10 Ft Width (Defense Highways) for Left Roadway	
B23	FR15		Vertical Clearance Over 10 Ft Width (Defense Highways) for Right Roadway	
B24	5C28		Defense Highway Designation	100
B27	5C10		Recent Average Daily Traffic	29
B27	6B17		Average Daily Traffic	
B28	5C11		Year of Average Daily Traffic	30
B29	6C27		Average Daily Truck Traffic	
B30	6C28		Year of Average Daily Truck Traffic	
B30A	5C14		Average Daily Truck Traffic (Percent)	109
B31	6C35		Vertical Clearance Signing Left	
B31	6C36		Vertical Clearance Signing Right	
B32	5A07		Features Intersected	6A
B33	5A08		Facility Carried by Structure	7
B34	5A19	5C08	Lanes Under the Structure	28B
B34	5C08		Lanes On and Under the Structure / Medians on Structure / Speed	28A
B35	6A19		Business Plan Network	
C01	5E04		Historical Significance	37
C01A	6A11		Covered Bridge Indicator	
C02	6A53		Estimated Cumulative Truck Traffic for Fatigue Damage	
C03	4B01		Design Load	31
C04	VD01		Design Method	
C05	5B12	6A26, 6A28	Main Span Material (FHWA)	43A
C05	5B13	6A29	Structural Configuration of Main Span (FHWA)	43B
C05	5B15	6A26, 6A28	Approach Span Material (FHWA)	44A
C05	5B16	6A29	Structural Configuration of Approach Spans (FHWA)	44B
C05	6A26		Material Used for Main Unit, Approach Unit, Sign Structure and Walls (Department)	
C05	6A27		Physical Makeup of Primary Load Carrying Members for Main Unit, Approach Unit, Sign Structure and Walls (Department)	
C05	6A28		Type of Span Interaction for Main Unit, Approach Unit, Sign Structure and Walls (Department)	
C05	6A29		Structural Configuration Used for Main Unit, Approach Unit, Sign Structure and Walls (Department)	
C06	VD19		Length of Culvert Barrel Along Its Centerline	
C07	5B18		Structure Length	49
C07	6A08		Not Used - Reserved for Future Use	
C07A	5E01		NBIS Bridge Length	112
C08	5B17		Maximum Span Length	48
C09	5B01	6A38	Bridge Deck Structure Type	107
C09	6A38		Bridge Deck Type	107
C10	5B02		Deck Surface Type (Main Span)	108A
C10	5B03		Deck Membrane Type	108B
C10	5B04		Deck Protection Type	108C
C10	6A30		Wearing Surface Type on Approach Spans	
C10	6A31		Type of Membrane Used for Approach Spans	
C10	6A32		Type on Deck Corrosion Protection Used for Approach Spans	
C10A	6A33		Wearing Surface Thickness for Main and Approach Units	
C11	VD03		Geometry of Main Beams or Girders	
C12	VD05		Types of Steel & Other Metals Used in Bridge Members	
C14	6A52		Estimated Cumulative Truck Traffic in Thousands	
C15	6A54		Month and Year of Estimated Cumulative Truck Traffic	
C16	5B11		Total Number of Spans in Main Unit	45
C16	5B14		Total Number of Approach Spans	46
C17	SP03		Span Length	

APPENDIX C
BMS to BMS2 Conversion Chart

BMSCode	BMS2Code	BMS2 Link	Description	FHWA
C18	6A44		Fracture Critical Group Number for Main Unit and Approach Spans	
C18A	6A45		Critical Ranking Factor Type of Member for Main Unit and Approach Spans	
C18A	6A46		Critical Ranking Factor Fatigue Susceptibility for Main Unit and Approach Spans	
C18A	6A47		Critical Ranking Factor Material for Main Unit and Approach Spans	
C18A	6A48		Critical Ranking Factor Cumulative Truck Traffic for Main Unit and Approach Spans	
C19	6A39		Are There Pavement Relief Joints?	
C19A	6A41		Number of Deck Joints on Bridge	
C20	6A40		Type of Deck Forms Used	
C21	6A42		Type of Deck Reinforcement Bar Protection	
C22	VD25		Expansion Joint Type	
C22	VD26		Expansion Joint Movement Class	
C22	VD27		Expansion Joint Manufacturer	
C23	VD30		Type of Bearings	
C24	VD04		Type of Field Splice Used for Steel Beams	
C25	6A50		Do Plug Welds exist on Bridge Superstructure?	
C26	VD09		Compressive Strength of Beam Concrete at Release	
C27	VD08		Compressive Strength of Beam Concrete at 28 Days	
C28	VD13		Size of Prestressed Strands	
C29	VD11		Prestressed Design Tensioning Method	
C30	VD07		Are the Strands Straight or Draped?	
C31	VD06		Were the Prestressed Girders Cured by Vacuum Process?	
C32	VD28		Haunch Types	
C33	VD12		Void Type	
C34	6A05		Utilities Present on the Structure	
C35	VD02		Beams Designed for Live Load Continuity?	
C36	VD10		Type of Field Splice Prestressed Girders	
C37	VD14		Abutment Type	
C38	VD15		Abutment Foundation Type	
C39	VD16		Pier Material and Configuration	
C40	VD17		Pier Foundation Type	
C41	VD29		Type of Special Pier Cap	
C42	VD23		Type of Tie for Tied Arch Culverts	
C43	6A51		Do Plug Welds exist on Bridge Substructure?	
D01			Not Used	
D02	FT01		Name of Utility Company	
D02	FT06		Address of Utility Company	
D03	FT03		License Number of Utility Company(s) Carried by Bridge	
D04	FT04		Date the License Number Was Approved	
D05	FT05		Total Weight of Utility in Kips	
D06	5C01		Road/Route Name	
D06	FW01		Name of the Stream (Creek, River, etc.)	
D07	FW07		Drainage Area of Stream	
D08	FW11		Nominal Vertical Clearance Streambed to Structure	
D09	FW14		Design Flood Magnitude	
D09	FW15		Design Flood Elevation	
D09	FW16		Design Flood Frequency	
D09	FW17		Design Flood Velocity	
D10	FW12		Maximum Known Water Surface Elevation	
D10	FW13		Maximum Known Water Surface Elevation Year	
D11	FW08		Is the Stream Fishable (Stockable)?	
D12	4A21		Does Navigation Control Exist?	38
D12	4A22		Navigation Vertical Clearance	39
D12	4A23		Navigation Horizontal Clearance	40
D12	4A24		Minimum Navigation Vertical Clearance - Vertical Lift Bridge	116
D12A	4A07		Pier Protection - Dolphins & Fenders	111
D12B	IN22		Calculated Scour Depth w/100 Year Flood	
D12B	IN23		Calculated Scour Depth w/500 Year Flood	
D13	4A01	VP02	Is the Bridge Open, Posted, or Closed?	41
D13	VP02		Posting Status	41
D14	VP03		Special Restrictive Posting	
D15	VP04		Posted Weight Limit	
D15	VP05		Posted Limit Combination	
D16	VP01		Status Date	
D17	VP01		Status Date	
D18	VP06		Reason for Posting or Closing the Bridge	
D19	VP07		Field Conditions	
D20	VP08		Special Conditions	
D21	VP09		Impact	
E01	7A09		Inspection Frequency	91
E02	7A14		Next Inspection Performed By	
E02A	6A10		Flood Inspection	
E03	VI12		Special Equipment Type	
E04	6B01		Type of Special Inspection That Is Needed	
E05	7A10		Next Inspection Date	
E05A	VI02		High Voltage Power Line	
E06	7A01		Inspection Date	90
E06	7A01		Inspection Date	93C
E07	7A03		Primary Type of Inspection	

**APPENDIX C
BMS to BMS2 Conversion Chart**

BMSCode	BMS2Code	BMS2 Link	Description	FHWA
E07	7A06		Type of Compliance Inspections Performed	
E07	IS01		Inspection Type for Sign/Light Structure	
E07	IW01		Inspection Type for Wall Structure	
E08	7A05		Inspection Performed By	
E09	6B26		NBI Crew Hours (Actual)	
E09	7A12		NBI Inspection Crew Hours	
E10	6B27		Crane Hours (Actual)	
E10	7A13		Bridge Inspection Crane Hours	
E11	6B32		Inspection Engineering Cost	
E11	6B33		Inspection Rigging Cost	
E11	6B34		Inspection Office Cost	
E12	7A05		Inspection Performed By	
E13	6B24		Agency that Hired the Consultant	
E14	6B38		Approach Slab	
E15	6B39		Approach Roadway Condition Rating	
E16	6B40		Deck Wearing Surface Condition Rating	
E17	1A01		Deck Condition Rating	58
E18	1A04		Superstructure Condition Rating	59
E19	6B36		Paint Condition Rating	
E19	6B37		Extent of the Paint Condition	
E19	VA02		Extent of Paint Applied to the Structure	
E20	1A02		Substructure Condition Rating	60
E21	1A05		Channel and Channel Protection Condition Rating	61
E22	1A03		Culvert Condition Rating	62
E23			Not Used	
E24	4A09		Structural Evaluation	67
E25	4A10		Deck Geometry Appraisal	68
E26	4A11		Underclearance Appraisal	69
E27	1A06		Waterway Adequacy Appraisal	71
E27	IL02		Risk of Overtopping	71
E27	IL03		Traffic Delay	71
E28	4A02		Approach Roadway Alignment Appraisal	72
E28A	4A03		Not Used. Reserved for Future Use.	
E28A	4A04		Not Used. Reserved for Future Use.	
E28A	4A05		Not Used. Reserved for Future Use.	
E28A	4A06		Not Used. Reserved for Future Use.	
E28A	IA02		Adequacy of Traffic Safety Features	36A, B, C, D
E29	4B03		Bridge Posting	70
E29A	4A08		Scour Critical Bridge Indicator	113
E30	4B07	IR10	Inventory Rating	66
E30	4B11	IR10	H20 Inventory Rating	
E30	6B18		Inventory Rating	
E30	IR04		Load Type	
E30	IR10		Inventory Rating	66
E31	4B05	IR11	Operating Rating	64
E31	4B09	IR11	H20 Operating Rating	
E31	IR04		Load Type	
E31	IR11		Operating Rating	64
E32	4B04	IR06	Operating Rating Type	63
E32	4B06	IR06	Inventory Rating Type	65
E32	4B08	IR06	H20 Operating Rating Type	
E32	4B10	IR06	H20 Inventory Rating Type	
E32	IR06		Rating Method	63
E32	IR06		Rating Method	65
E32	IR12		Governing Criteria - Inventory	
E32	IR13		Governing Criteria - Operating	
E33	IR07		Type of Structural Member that Controls the Inventory Rating	
E34	IR08		Fatigue Stress Category of the Controlling Member	
E35	IR09		Type of Loading that Controls the Fatigue Inventory Rating	
E36	IR18		Fatigue Stress Range	
E37	IR15		Year of AASHTO Specifications Used in Determining Ratings	
E38	IR14		Year of AASHTO Manual Used in Determining Ratings	
F01	3B07		Year of Improvement Cost Estimate	97
F02	3B01		Proposed Deck/Super Work	75A
F02	3B02		Proposed Sub Work	75A
F02	6A55		Proposed Major Deck Reconstruction	
F02	6A56		Proposed Major Superstructure Reconstruction	
F02	6A57		Proposed Major Substructure Reconstruction	
F03			Not Used	
F04	3B03		Improvement Length	76
F05	3B03		Improvement Length	76
F06			Not Used	
F07			Not Used	
F08			Not Used	
F09			Not Used	
F10	5C12		Future Average Daily Traffic	114
F11	5C13		Year of Future Average Daily Traffic	115
F12			Not Used	

**APPENDIX C
BMS to BMS2 Conversion Chart**

BMSCode	BMS2Code	BMS2 Link	Description	FHWA
F13			Not Used	
F14			Not Used	
F15	3B04		Bridge Improvement Cost	94
F16	3B04		Bridge Improvement Cost	94
F17	3B04		Bridge Improvement Cost	94
F18	3B04		Bridge Improvement Cost	94
F19			Not Used	
F20	3B04		Bridge Improvement Cost	94
F21	3B05		Roadway Improvement Cost	95
F22			Not Used	
F23			Not Used	
F24	3B06		Estimated Total Cost of Overall Improvement Project	96
F24A			Not Used	
F25			Not Used	
F26			Not Used	
F27			Not Used	
G01			Not Used	
G02			Not Used	
G03	VN07		Drawing Number for the Repair	
G04			Not Used	
G05			Not Used	
G06			Not Used	
G07	VN07		Drawing Number for the Repair	
G08			Not Used	
G09	VA01		Date the Bridge Was Painted	
G10	VA03		Tons of Steel Painted	
G11	VA04		Estimated Surface Area in Square Feet Requiring Painting	
G12	VA09		Coats of Paint Applied	
G13	VA11		Gallons of Paint Applied	
G14	VA08		Color Number of Paint	
G15	VA12		Type of Cleaning Used	
G16	VA02		Extent of Paint Applied to the Structure	
G16	VA05		Type of Primer Coat Applied to the Structure	
G16	VA06		Type of Intermediate Coat Applied to the Structure	
G16	VA07		Type of Finish Coat Applied to the Structure	
G16	VA10		Thickness of Paint Applied to the Structure	
G17	VA13		Cost of Painting	
H01	IM03		Action	
H02	IM03		Action	
H03	3A03		Structure Unit	
H03	IM09		Location	
H04	IM03		Action	
H05	IM04		Estimated Quantity	
H06	IM10		Estimated Cost	
H07			Not Used	
H08	IM05		Priority	
H09	IM11		Work Assign	75B
H10	IM06		Initial Recommended Date	
H10A			Not Used	
H11			Not Used	
H12	IM08		Target Year	
J01	7A01		Inspection Date	93A
J02	6A44		Fracture Critical Group Number for Main Unit and Approach Spans	
J03	6A45		Critical Ranking Factor Type of Member for Main Unit and Approach Spans	
J03	6A46		Critical Ranking Factor Fatigue Susceptibility for Main Unit and Approach Spans	
J03	6A47		Critical Ranking Factor Material for Main Unit and Approach Spans	
J03	6A48		Critical Ranking Factor Cumulative Truck Traffic for Main Unit and Approach Spans	
J04	6A49	6A45-48	Total FCM Critical Ranking Factor for Main Unit and Approach Spans	
J05	7A09		Inspection Frequency	92A
J06	6A44		Fracture Critical Group Number for Main Unit and Approach Spans	
J07	6A45		Critical Ranking Factor Type of Member for Main Unit and Approach Spans	
J07	6A46		Critical Ranking Factor Fatigue Susceptibility for Main Unit and Approach Spans	
J07	6A47		Critical Ranking Factor Material for Main Unit and Approach Spans	
J07	6A48		Critical Ranking Factor Cumulative Truck Traffic for Main Unit and Approach Spans	
J08	6A49	6A45-48	Total FCM Criticality Ranking Factor for Main Unit and Approach Spans	
J09	5D02		Structure Unit ID	
J09	5D03		Structure Unit Description	
J09	5D04		Structure Unit Type	
J09	IF01		FC Location	
J10	IF03		Fracture Critical Member	
J11	IF04		Fracture Critical Detail	
J11A	IF05		Fatigue Stress Category of the Fracture Critical Detail	
J12	IF06		Fracture Critical Member Detail Condition	
M01	6B42		Structural Adequacy and Safety Component	
M02	6B43		Serviceability and Functional Obsolescence Component	
M03	6B44		Essentiality for Public Use Component	
M04	6B45		Special Reductions Component	
M05	4A13		Federal Sufficiency Rating of the Structure	

**APPENDIX C
BMS to BMS2 Conversion Chart**

BMSCode	BMS2Code	BMS2 Link	Description	FHWA
M06	6B41		Eligibility of Bridge FCB Funds	
M07			Not Used	
M08	4A12	1A01-4	Structurally Deficient	
M09			Not Used	
M10			Not Used	
M11			Not Used	
M12			Not Used	
M13			Not Used	
M14			Not Used	
M15			Not Used	
M16			Not Used	
M17			Not Used	
M18			Not Used	
M19			Not Used	
M20			Not Used	
M21			Not Used	
M22			Not Used	
M23			Not Used	
M24			Not Used	
M25			Not Used	
M26			Not Used	
M27			Not Used	
M28			Not Used	
M29			Not Used	
M30			Not Used	
M31			Not Used	
M32			Not Used	
M33			Not Used	
M34	6B46		Total Maintenance Deficiency Points Assigned to the Bridge	
M35			Not Used	
M36			Not Used	
M37			Not Used	
N01	IM14a		Date Completed	
N02			Not Used	
N03	IM15a		Notes	
N04			Not Used	
N05	IM18		Actual Quantity	
N06	IM19		Actual Cost	
N07			Not Used	
N08			Not Used	
O01			Not Used	
O02			Not Used	
O03			Not Used	
O04			Not Used	
O05			Not Used	
O06			Not Used	
O07			Not Used	
O08			Not Used	
O09			Not Used	
O10			Not Used	
O11			Not Used	
O12			Not Used	
O13			Not Used	
O14			Not Used	
O15			Not Used	
O16			Not Used	
O17			Not Used	
O18			Not Used	
O19			Not Used	
O20			Not Used	
PA01	SS11		APRAS Ref	
PA02	SS13		Total APRAS Span	
PA03	SS12		Axle Weight	
PA04	5D02		Structure Unit ID	
PA04	SS01		Apras Span ID	
PA04	SS03		Back Span Indicator	
PA05	SS04		Identical Span No.	
PA06	SS05		Continuous Beginning Span	
PA06	SS06		Continuous End Span	
PA07	5D04		Structure Unit Type	
PA08	SS07		Center to Center Span Length	
PA09	SP07		Material Makeup of Main Load Carrying Members	
PA09	SP08		Physical Makeup of Primary Load Carrying Members	
PA09	SP09		Type of Span Interaction of Main Members Only	
PA09	SP10		Structural Configuration	
PA09	SS09		Department Structure Type	
PA10	SS08		Moment Comparison Span Length	
PA11	SL11		Single Lane Span ID	

**APPENDIX C
BMS to BMS2 Conversion Chart**

BMSCode	BMS2Code	BMS2 Link	Description	FHWA
PB01			Not Used	
PB02			Not Used	
PB03	SL02		Multi-Lane Live Load Distribution Factors for Moment	
PB03	SL03		Single Vehicle Live Load Distribution Factors for Moment	
PB04	SL04		Multi-Lane Live Load Distribution Factors for Shear	
PB04	SL05		Single Vehicle Live Load Distribution Factors for Shear	
PB05	SL06		Positive Moment Comparison Factor Comment (Normal Traffic)	
PB05	SL07		Positive Moment Comparison Factor Comment (Restricted Traffic)	
PB06	SL08		Negative Moment Comparison Factor Comment (Normal Traffic)	
PB06	SL09		Negative Moment Comparison Factor Comment (Restricted Traffic)	
PB07	SL10		Load Conditions for the Permit	
PB08	6C01		County - State Roadway Location	3
PB08	6C02		State Route Number - State Roadway Location	5D
PB08	6C03		Segment - State Roadway Location	
PB08	6C04		Offset - State Roadway Location	
PB08	SC02		RMS Route	
PB09	5C03		Position/Prefix - Is the Feature Intersected On or Under the Bridge?	5A
PB10	SC05		Non-Restricted Vertical Clearance	
PB11	SC09		Horizontal Distance	
PB11	SC10		Vertical Clearance	
PB12	SC03		Permit Condition	
PB13	SC07		Minimum Travel Width - Left	
PB13	SC08		Minimum Travel Width - Right	
PB14	SC04		Permit Condition Description	
PC01			Not Used	
PC02			Not Used	
PC03	IR07		Type of Structural Member that Controls the Inventory Rating	
PC04	IR15		Year of AASHTO Specifications Used in Determining Ratings	
PC05			Not Used	
PC06	IR08		Fatigue Stress Category of the Controlling Member	
PC07			Not Used	
PC08	SL01		Date the Ratings Were Computed	
PC09	4B07	IR10	Inventory Rating	66
PC09	4B11	IR10	H20 Inventory Rating	
PC09	IR10		Inventory Rating	66
PC10	4B05	IR11	Operating Rating	64
PC10	4B09	IR11	H20 Operating Rating	
PC10	IR11		Operating Rating	64
PC11	SL16		Rating Notes	
PC12	SL12		Restricted Span ID (1)	
PC13	SL13		Restriction Codes 1, 2 & 3	
PC14	SL14		Restricted Span ID (2)	
PC15	SL15		Restriction Codes 4, 5, 6, & 7	
PR Screen	6C30		General Segment Ahead Label	
PR Screen	6C31		User Segment Ahead Label	
PR Screen	6C32		General Segment Back Label	
PR Screen	6C33		User Segment Back Label	
R01	6C01		County - State Roadway Location	3
R01	6C02		State Route Number - State Roadway Location	5D
R01	6C03		Segment - State Roadway Location	
R01	6C04		Offset - State Roadway Location	
R02	5C03		Position/ Prefix - Is the Feature Intersected On or Under the Bridge?	5A
R03	5C04		Route Signing Prefix	5B
R03	5C06		State Traffic Route / Suffix	
R04	5C10		Recent Average Daily Traffic	29
R05	5C11		Year of Average Daily Traffic	30
R06	6C27		Average Daily Truck Traffic	
R07	6C28		Year of Average Daily Truck Traffic	
R07A	5C14		Average Daily Truck Traffic (Percent)	109
R08	6C07		Government Level of Control	
R09	6C06		Federal Aid	
R10	5C22		Functional Classification	26
R10	IL04		Functional Classification	
R11	6C08		Urban/Rural Designation	
R12	6C09		Highway Indicator	
R12	6C12		Interstate Network (INT) Indicator	
R12	6C13		Not Used - Reserved for Future Use	
R12	6C14		ATTT Indicator	
R12	6C15		RMS NHS Indicator	
R12	6C16		TTTN Indicator	
R13	6A01		State Senatorial District	
R14	6A02		United States Congressional District	
R15	6A03		Legislative District	
S01	7A01		Inspection Date	
S01A	7A03		Primary Type of Inspection	
S01A	7A06		Type of Compliance Inspections Performed	
S01A	IS01		Inspection Type for Sign/Light Structure	
S02	7A09		Inspection Frequency	

APPENDIX C
BMS to BMS2 Conversion Chart

BMSCode	BMS2Code	BMS2 Link	Description	FHWA
S02	IS13		Frequency of Inspection of Sign/Light Structure	
S02A	6B20		Next Inspection Type	
S02A	IS12		Next Inspection Type for Sign/Light Structure	
S03	7A05		Inspection Performed By	
S04	VII2		Special Equipment Type	
S05	VS25		Total Area of Signs on the Structure	
S06	VS12		Number of Lights on Structure	
S12	5B12	6A26, 6A28	Main Span Material (FHWA)	43A
S12	5B13	6A29	Structural Configuration of Main Span (FHWA)	43B
S12	6A26		Material Used for Main Unit, Approach Unit, Sign Structure and Walls (Department)	
S12	6A27		Physical Makeup of Primary Load Carrying Members for Main Unit, Approach Unit, Sign Structure and Walls (Department)	
S12	6A28		Type of Span Interaction for Main Unit, Approach Unit, Sign Structure and Walls (Department)	
S12	6A29		Structural Configuration Used for Main Unit, Approach Unit, Sign Structure and Walls (Department)	
S12A	5A15		Year the Bridge Was Built	
S13	VS11		Number of Signs Displayed on Sign Structure	
S14	7A12		NBI Inspection Crew Hours	
S19	VS26		Height of Column	
S20	VS28		Number of Spans	
S20A	5A19	5C08	Lanes Under the Structure	28B
S20A	VS29		Not Used - Reserved for Future Use	
S21	5B18		Structure Length	
S21	VS27	5B18	Length of Sign Structure	
S21A	VS30		Median Width	
S22	IS02		Column Base Condition Rating	
S23	IS03		Guardrail Condition Rating	
S24	IS04		Column Condition Rating	
S25	IS05		Access Condition Rating	
S26	IS06		Sign Condition Rating (Sign Structure Only)	
S27	IS07		Light Condition Rating	
S28	IS08		Surface Condition Rating	
S29	IS09		Horizontal Member Condition Rating (Sign Structures Only)	
S30	IS10		Overall Condition Rating of the Sign/Light Structure	
S31	IS11		Inspection Notes	
S32	IS11		Inspection Notes	
S33	IS11		Inspection Notes	
S34	IS11		Inspection Notes	
S35	IS11		Inspection Notes	
S36	IS11		Inspection Notes	
S37	IS11		Inspection Notes	
T01	7A01		Inspection Date	
T02	7A09		Inspection Frequency	
T02	IW13		Frequency of Inspection of Wall Structure	
T03	7A05		Inspection Performed By	
T04	VW28		Minimum Wall Height	
T05	VW29		Maximum Wall Height	
T06	5B18		Structure Length	
T06	VW30		Not Used - Reserved for Future Use	
T07	VW31		Approximate Area of the Wall	
T08	5B12	6A26, 6A28	Main Span Material (FHWA)	43A
T08	5B13	6A29	Structural Configuration of Main Span (FHWA)	43B
T08	6A26		Material Used for Main Unit, Approach Unit, Sign Structure and Walls (Department)	
T08	6A27		Physical Makeup of Primary Load Carrying Members for Main Unit, Approach Unit, Sign Structure and Walls (Department)	
T08	6A28		Type of Span Interaction for Main Unit, Approach Unit, Sign Structure and Walls (Department)	
T08	6A29		Structural Configuration Used for Main Unit, Approach Unit, Sign Structure and Walls (Department)	
T08	VW01		Not Used - Reserved for Future Use	
T08	VW02		Not Used - Reserved for Future Use	
T08	VW03		Not Used - Reserved for Future Use	
T08	VW04		Not Used - Reserved for Future Use	
T09	7A12		NBI Inspection Crew Hours	
T10	VW10		Wall Use	
T11	VW06		Primary Backfill Material	
T11	VW07		Secondary Backfill Material	
T12	VW26		Backfill Slope	
T13	IW03		Backfill Condition Rating	
T14	IW04		Wall Condition Rating	
T15	IW07		Drainage Condition Rating	
T16	IW08		Foundation Condition Rating	
T17	IW10		Overall Condition Rating of the Wall	
T18	2A02		Inspection Notes	
T18	IW11		Wall Inspection Notes	
W01	7A01		Inspection Date	
W01A	7A01		Inspection Date	93B
W02	7A03		Primary Type of Inspection	
W02	7A06		Type of Compliance Inspections Performed	
W02A	7A03		Primary Type of Inspection	
W02A	7A06		Type of Compliance Inspections Performed	
W03	7A09		Inspection Frequency	92B
W04	7A09		Inspection Frequency	92B

APPENDIX C
BMS to BMS2 Conversion Chart

BMSCode	BMS2Code	BMS2 Link	Description	FHWA
W06	4A08		Scour Critical Bridge Indicator	113
W07	IN15		Stream Bed Material (SC)	
W07	IU06		Stream Bed Material	
W07	IU07		Stream Bed Material Description	
W09	5D02		Structure Unit ID	
W09	IN01		Abutment, Pier, Culvert, Wingwalls Referencing	
W10	IN13		PA Foundation Type (SC)	
W10	IN14		OSA Foundation Type (SC)	
W11	IN18		Water Depth	
W11A	IN03		Observed Scour Rating	
W11B	IN16		Underwater Inspection Type	
W11C	IN17		Observed Scour Depth	
W11D	IN22		Calculated Scour Depth w/100 Year Flood	
W11E	IN23		Calculated Scour Depth w/500 Year Flood	
W11F	IN21		Countermeasures	
W12	IN24		Inspection Notes	
W13	IN02		Previous/Current Inspection	
W14	IU02		Number of Units Inspected	
W15			Not Used	
W16			Not Used	
W17	6B24		Agency that Hired the Consultant	
	1A07		Unrepaired Spalls	
	1A08		Not Used - Reserved for Future Use	
	1A09		Inspection Status	
	1A09a		Inspection Reviewer	
	1A10		Element Quantity	
	1A11		Qty1 / Qty2 / Qty3 / Qty4	
	1A12		Element Condition	
	1B01		Element ID	
	1B02		Structure Unit	
	1B03		Environment	
	1B04		Not Used - Use Item 1A10	
	1B05		Scale Factor	
	1B06		Not Used - Reserved for Future Use	
	1B07		Element Description	
	3A01		Not Used - Reserved for Future Use	
	3A02		Candidate ID	
	3A04 - 3A14		Not Used - Reserved for Future Use	
	4A08b		Scour Critical Category	
	4A14	1A01-4	Bridge Condition	
	4A16	6C20, 6C21	Minimum Vertical Underclearance Reference Feature	54A
	4A18		Minimum Lateral Underclearance Reference Feature	55A
	4B02	IR03	Rating Date and Initials	
	4B12	IR10, IR11	ML80	
	4B13	IR10, IR11	TK527	
	4B14		Not Used - Reserved for Future Use	
	4B15		Not Used - Reserved for Future Use	
	4B16		Not Used - Reserved for Future Use	
	5A03		NBI Structure Number	
	5A04		District Number	2
	5A22		Not Used - Reserved for Future Use	
	5A23		Agency Administration Area	
	5A24		Reporting Group	
	5B19	5B07, 5B18	Deck Area	
	5B20		Total Length	
	5C02		Not Used - Reserved for Future Use	
	5C07		Not Used - Reserved for Future Use	
	5C09		ADT Class	
	5C16		Detour Speed	
	5C17		Accident Count and Rate	
	5C18		Mile Point	11
	5C19		National Base Highway Network	12
	5C20		LRS Inventory Route and Subroute Number	13A
	5C20		LRS Inventory Route and Subroute Number	13B
	5C23		Traffic Direction	102
	5C25	6C18, 6C19	Total Horizontal Clearance	47
	5C31		Federal Lands Highway	105
	5C34		Emergency Indicator	
	5C35		RMS Roadway BPN	
	5C36		Adjoining Feature	
	5C37		Not Used - Reserved for Future Use	
	5C38		Not Used - Reserved for Future Use	
	5C39		Not Used - Reserved for Future Use	
	5D01		Unit Key	
	5D05		Default Bridge Unit Indicator	
	5E05		SHPO Key Number	
	5E06		Not Used - Reserved for Future Use	
	5E07		Not Used - Reserved for Future Use	

APPENDIX C
BMS to BMS2 Conversion Chart

BMSCode	BMS2Code	BMS2 Link	Description	FHWA
	5E08		Not Used - Reserved for Future Use	
	5E09		Not Used - Reserved for Future Use	
	5E10		Asbestos Containing Material (ACM) Status	
	5E11		ACM Inspections Required	
	5E12		ACM Inspections Completed	
	5E13		ACM Inspection Date	
	5E14		ACM Quantity	
	5E15		ACM Number	
	5E16		ACM Locations	
	5E17		ACM Locations	
	5E18		Not Used - Reserved for Future Use	
	5E19		Not Used - Reserved for Future Use	
	5E20		Not Used - Reserved for Future Use	
	5E21		Not Used - Reserved for Future Use	
	5E22		Not Used - Reserved for Future Use	
	5E23		Not Used - Reserved for Future Use	
	5E24		Bridge Group	
	6A12		Demolished / Replaced Indicator	
	6A13		Demolished / Replaced Date	
	6A14		Historic District Contribution Indicator	
	6A15		Historic District	
	6A16		Preservation Candidate Indicator	
	6A17		Future Bridge Bill Candidate Indicator	
	6A18		Network	
	6A20		Watershed Name	
	6A21		Deicing Equipment Description	
	6A22		Corridor	
	6A24		Turnback Description	
	6A25		Not Used - Reserved for Future Use	
	6A34		Date Wearing Surface Thickness for Main and Approach Units was Recorded	
	6A35		Surface Thickness Over and Under	
	6A36		Year Protection System was Installed	
	6A37		Protection System Note	
	6A58		Not Used - Reserved for Future Use	
	6B02		New Wearing Surface Under the Bridge Indicator	
	6B03		Inventory Correction Indicator	
	6B04		Bump at Bridge Indicator	
	6B05		Deck Overlay Measurement Date	
	6B06		Utility Repair Required	
	6B07		Estimated Spall or Delamination Percent	
	6B08		Estimated Spall or Delamination Percent Date	
	6B09		Weather Condition	
	6B10		Estimated Chloride Content Percent	
	6B11		Estimated Chloride Content Date	
	6B12		Temperature	
	6B13		Underclearance Controlling Vertical	
	6B14		Table Used for Deck Geometry Appraisal	
	6B15		Not Used - Reserved for Future Use	
	6B16		Appraisal Based On	
	6B19		Capacity Appraisal Control	
	6B21		Crane Inspection Date	
	6B22		Not Used - Reserved for Future Use	
	6B23		Team Helper	
	6B25		Inspection Contract Number	
	6B28		Fracture Critical Hours (Actual)	
	6B29		Other 1	
	6B30		Underwater Hours (Actual)	
	6B31		Other 2	
	6B35		New Paint Since Last Inspection	
	6B47		Deck Cracking Metric	
	6B48		Combustible Material Stored Under the Bridge	
	6B49		Inaccessible Area of the Bridge during Inspection	
	6C17		Not Used - Reserved for Future Use	
	6C24		Not Used - Reserved for Future Use	
	6C29		Not Used - Reserved for Future Use	
	6C34		Feature Type	
	6C37		Vertical Clearance Sign Posting Left	
	6C38		Vertical Clearance Sign Posting Right	
	7A02		Team Leader	
	7A04		Review Required	
	7A07		Required Inspections	92, 93
	7A08		Last Inspection Date	93
	7A11		Next Team Leader	
	7A15		Fracture Critical Inspection Hours	
	7A16		Other 1 Hours	
	7A17		Underwater Inspection Hours	
	7A18		Other 2 Hours	
	FR08		Span Description	

APPENDIX C
BMS to BMS2 Conversion Chart

BMSCode	BMS2Code	BMS2 Link	Description	FHWA
	FR09		Additional Operator	
	FR16		Notes	
	FR17	FR05	Railroad Division	
	FR18	FR05	Railroad Subdivision	
	FR19	FR05	Railroad Branch	
	FR20	FR05	Railroad Owner	
	FT02		Utility Type	
	FT07		Hazmat Indicator	
	FT08		Location of Utility	
	FT09		Contact Information	
	FT10		Notes	
	FW02		Stream Classification 1	
	FW03		Stream Classification 2	
	FW04		Timeframe	
	FW05		Stream Classification 3	
	FW06		Permit Type	
	FW09		Water Flow Direction	
	FW10		Primary Waterway	
	FW18		Pollutants Description	
	FW19		Stream Restrictions	
	FW20		Notes	
	IA01		Location	
	IA03		Safety Feature Description	
	IC01		Inspection Comment Type	
	IC02		Inspection Comment	
	IC03		Substructure Unit	
	IC04		Substructure Comment Type	
	IC05		Structure Unit Comments	
	ID01		Type of Sign	
	ID02		Sign Needed?	
	ID03		Sign Message	
	ID04		Near Advance	
	ID05		Far Advance	
	ID06		Bridge Site Near	
	ID07		Bridge Site Far	
	ID08		Signing Notes	
	IF02		Fracture Critical Member Type	
	IL01		Not Used - Reserved for Future Use	
	IL05		Maximum Known Water Surface Elevation	
	IL06		Date of Maximum Known Water Surface Elevation	
	IL07		New Maximum Water Surface Status	
	IL08		Maximum Water Surface Notes	
	IL09		Underclearance Origin Description	
	IL10		Horizontal Underclearance	
	IL11		Vertical Underclearance	
	IL12		Underclearance Notes	
	IL13		Worst Flood Event	
	IL14		Worst Flood Event Date	
	IM01		Scope	
	IM02		Element	
	IM05b		Date Maintenance Priority Changed	
	IM07		Status of Work Candidate	
	IM12		Drawing Indicator	
	IM13		Permit Indicator	
	IM14b		Plan of Action Date	
	IM14c		Mitigation Date	
	IM15b		Deferred Notes	
	IM15c		Authorized Bridge Approval	
	IM15d		Authorized Maintenance Approval	
	IM15e		Not Used - Reserved for Future Use	
	IM16		SAP Closed Date	
	IM17		SAP Work Order Number	
	IM20		MPMS #	
	IM21		Notes	
	IN04		Change Since Last Inspection (SC)	
	IN05		Scour Hole (SC)	
	IN06		Debris Potential	
	IN07		Substructure Scourability	
	IN08		Opening Adequacy/Channel	
	IN09		Sediment Deposits	
	IN10		Alignment	
	IN11		Velocity/Stream Slope	
	IN12		OSA Pier / Abutment Type (SC)	
	IN19		Movement Indicator (SC)	
	IN20		Scour / Undermining Indicator	
	IR01a		Load Rating Review Recommended	
	IR01b		Reviewer Action	
	IR02		Rating Approval Date	

APPENDIX C
BMS to BMS2 Conversion Chart

BMSCode	BMS2Code	BMS2 Link	Description	FHWA
	IR02a		Rating Approval Engineer	
	IR03		Calculation Date	
	IR05		NBI	
	IR11a		SLC (Safe Load Capacity) - Rating	
	IR16		Engineer	
	IR17		Rating Dataset	
	IR19		Notes	
	IR20		Inventory Rating Factor	
	IR21		Operating Rating Factor	
	IS14		Complete Next Inspection By This Date	
	IS15		Tag Existence and Condition	
	IT (L.1)		Load Rating Method	
	IT (L.2)		Inventory Load Rating Factor	
	IT (L.3)		Operating Load Rating Factor	
	IT (L.4)	VP02	Tunnel Load Posting Status	
	IT (L.5)		Posting Load - Gross	
	IT (L.6)		Posting Load - Axle	
	IT (L.7)		Posting Load - Type 3	
	IT (L.8)		Posting Load - Type 3S2	
	IT (L.9)		Posting Load - Type 3-3	
	IT (L.10)		Height Restriction	
	IT (L.11)		Hazardous Material Restriction	
	IT (L.12)		Other Restrictions	
	IU00a		Not Used - Reserved for Future Use	
	IU00b		Not Used - Reserved for Future Use	
	IU01		Recalculate Scour Critical Bridge Indicator (SCBI)	
	IU03		SCBI Source	
	IU04		Observed Scour Assessment (OSA)	
	IU04b		Was the Scour Calculator run for this inspection?	
	IU05		Scour Assessment Rating (SAR)	
	IU08		Debris Potential	
	IU09		Trapping Potential	
	IU10		Pressure Flow	
	IU11		Near Abutment Location	
	IU12		Far Abutment Location	
	IU13		Upstream Left Wingwall Presence	
	IU14		Condition of Upstream Left Wingwall	
	IU15		Upstream Right Wingwall Presence	
	IU16		Condition of Upstream Right Wingwall	
	IU17		Horizontal Debris Blockage Start	
	IU18		Horizontal Debris Blockage End	
	IU19		Vertical Debris Blockage Start	
	IU20		Vertical Debris Blockage End	
	IU21		Current Scour Countermeasure Type	
	IU22		Location of Current Scour Countermeasure	
	IU23		Condition of Current Scour Countermeasure	
	IU24		Subunit Number	
	IU25		Location of Potential Scour Countermeasure	
	IU26		Work Candidate	
	IU27		SCBI Code	
	IU28		SCBI Case	
	IW02		Anchorage Condition Rating	
	IW05		Panel Condition Rating	
	IW06		Post Condition Rating	
	IW09		Parapets Condition Rating	
	IW12		Next Inspection Type for Wall Structure	
	IW14		Complete Next Inspection By This Date	
	SC01		Span ID Suffix	
	SC06		Non-Restricted Clearance Review Indicator	
	SG01		Structure Group Type	
	SG02		Structure Group Name	
	SG03		Structure Group Identification Number	
	SG04		Structure Group Relationship Type	
	SG05		Structure Group Description	
	SP01	5D04	Span Type	
	SP02	5D02	Label	
	SP04		Span Deck Width	
	SP05		Flare Indicator	
	SP06		Span Description	
	SS02		Actual Span	
	SS10		Notes	
	VA14		Notes	
	VD18		Opening Type	
	VD20		Minimum Fill Height Over Culvert	
	VD21		Maximum Fill Height Over Culvert	
	VD22		Effective Width of Hydraulic Opening	
	VD24		Floor Type	
	VD31		Number of Locations for Bearing Seat and Horizontal Surface Cleaning	

APPENDIX C
BMS to BMS2 Conversion Chart

BMSCode	BMS2Code	BMS2 Link	Description	FHWA
	VD32		Bridge Cleaning Notes	
	VD33		Number of Scuppers with Downspouts	
	VD34		Number of Scuppers without Downspouts	
	VI01		Minimum Crane Reach Required	
	VI03		Railroad Flagger Required	
	VI04		Traffic Flagger Required	
	VI11		Inspection Limitations	
	VI13		Equipment Quantity	
	VI14		Consumable?	
	VI15		Assigned To	
	VI16		Notes	
	VI17		Not Used - Reserved for Future Use	
	VI18		Permit Type	
	VI19		Not Used - Reserved for Future Use	
	VI20		Point of Contact	
	VI21		Phone # for Point of Contact	
	VI22		Fax # for Point of Contact	
	VI23		Email for Point of Contact	
	VI24		Notes	
	VM06		PUC Order Date	
	VM07		Notes	
	VN02		Soil Boring Notes	
	VN03		Test Description	
	VN04		Storage Location	
	VP10		Permanently Closed Structure (District Use Only)	
	VS01		Not Used - Reserved for Future Use	
	VS02		Not Used - Reserved for Future Use	
	VS03		Not Used - Reserved for Future Use	
	VS04		Not Used - Reserved for Future Use	
	VS05		Mounting Type	
	VS06		Foundation Type	
	VS07		Manufacturer	
	VS08		Inspection Location Information	
	VS09		Not Used - Reserved for Future Use	
	VS13		Not Used - Reserved for Future Use	
	VS14		Not Used - Reserved for Future Use	
	VS15		Not Used - Reserved for Future Use	
	VS16		Not Used - Reserved for Future Use	
	VS17		Distance From Roadway	
	VS18		Direction From Roadway	
	VS19		Maximum Diameter of High Mast Tower	
	VS20		Minimum Diameter of High Mast Tower	
	VS21		Is the Mounting Bolt Base Grounded?	
	VS22		Height of High Mast Tower	
	VS23		Movement	
	VS24		Alignment	
	VS31		Not Used - Reserved for Future Use	
	VS32		Not Used - Reserved for Future Use	
	VS33		Not Used - Reserved for Future Use	
	VS34		Dynamic Message Sign	
	VT (A.8)		Service in Tunnel	
	VT (C.3)		Direction of Traffic	
	VT (C.4)		Toll	
	VT (C.7)		Functional Classification	
	VT (C.8)		Urban Code	
	VT (D.1)			
	VT (D.4)			
	VT (I.15)		Border Tunnel State Code	
	VT (I.16)		Border Tunnel Financial Responsibility	
	VT (I.17)		Border Tunnel Number	
	VT (I.18)		Border Tunnel Inspection Responsibility	
	VT (N.1)		Under Navigable Waterway	
	VT (N.2)		Navigable Waterway Clearance	
	VT (N.3)		Tunnel or Portal Island Protection From Navigation	
	VT (S.1)		Number of Bores	
	VT (S.2)		Tunnel Shape	
	VT (S.3)		Portal Shape	
	VT (S.4)		Ground Conditions	
	VT (S.5)		Complex	
	VW05		Foundation Type	
	VW08		Historic Eligibility Information	
	VW09		Manufacturer	
	VW11		Mounting Type	
	VW12		Post Type	
	VW13		Not Used - Reserved for Future Use	
	VW15		Were Architectural Forms Used?	
	VW16		Type of Reinforcement Bar Protection	
	VW17		Compressive Strength Concrete at 28 Days	

APPENDIX C
BMS to BMS2 Conversion Chart

BMSCode	BMS2Code	BMS2 Link	Description	FHWA
	VW18		Support Information	
	VW19		Direction Information	
	VW20		Installed/Retrofitted	
	VW25		Distance to Road	
	VW27		Minimum Clearance	
	VW32		Not Used - Reserved for Future Use	
	VW33		Not Used - Reserved for Future Use	
	VW34		Not Used - Reserved for Future Use	

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Appendix D

SNTI to BMS2 Conversion

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Appendix D SNTI to BMS2 Conversion Chart

SNTI	BMS2	Description
I.1	5A03	Tunnel Number
I.2	5A02	Tunnel Name
I.3	5A14	State Code
I.4	5A05	County Code
I.5	5A06	Place Code
I.6	5A04	Highway Agency District
I.7	5C06	Route Number
I.8	5C06	Route Direction
I.9	5C04	Route Type
I.10	5A08	Facility Carried
I.11	5C20	LRS Route ID
I.12	5C18	LRS Mile Point
I.13	5A10	Tunnel Portal's Latitude
I.14	5A11	Tunnel Portal's Longitude
I.15	5A12	Border Tunnel State or County Code
I.16	5A12	Border Tunnel Financial Responsibility
I.17		Border Tunnel Number
I.18	VM03, VM04	Border Tunnel Inspection Responsibility
A.1	5A15	Year Built
A.2	5A16	Year Rehabilitated
A.3	5C08, 5A19	Total Number of Lanes
A.4	5C10	Annual Average Daily Traffic
A.5	5C14	Annual Average Daily Truck Traffic
A.6	5C11	Year of Annual Average Daily Traffic
A.7	5C15	Detour Length
A.8		Service in Tunnel
C.1	5A21	Owner
C.2	VO07	Operator
C.3	5C23	Direction of Traffic
C.4	5C21	Toll
C.5	6C15	NHS Designation
C.6	5C28	STRAHNET Designation
C.7	5C22	Functional Classification
C.8		Urban Code
G.1	5B18	Tunnel Length
G.2	6C20, 6C21	Minimum Vertical Clearance over Tunnel Roadway
G.3	5C27	Roadway Width, Curb-to-Curb
G.4	5B05	Left Sidewalk Width
G.5	5B06	Right Sidewalk Width
D.1	7A10	Routine Inspection Target Date
D.2	7A08	Actual Routine Inspection Date
D.3	7A09	Routine Inspection Interval
D.4	7A03	In-Depth Inspection
D.5	7A03	Damage Inspection
D.6	7A03	Special Inspection
L.1	IR06	Load Rating Method

Appendix D SNTI to BMS2 Conversion Chart

SNTI	BMS2	Description
L.2		Inventory Load Rating Factor
L.3		Operating Load Rating Factor
L.4	VP02	Tunnel Load Posting Status
L.5	VP04	Posting Load - Gross
L.6		Posting Load - Axle
L.7		Posting Load - Type 3
L.8		Posting Load - Type 3S2
L.9		Posting Load - Type 3-3
L.10		Height Restriction
L.11		Hazardous Material Restriction
L.12		Other Restrictions
N.1		Under Navigable Waterway
N.2		Navigable Waterway Clearance
N.3		Tunnel or Portal Island Protection From Navigation
S.1		Number of Bores
S.2		Tunnel Shape
S.3		Portal Shape
S.4		Ground Conditions
S.5		Complex

Appendix E

Crystal Reports Tables for BMS2 Items

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Appendix E
Crystal Reports Tables for BMS Items

BMS2Code	Table Name	COLUMN NAME	BMS Code
2A01	BRIDGE	NOTES	L_NAR_TEXT (AL)
3B01	BRIDGE	PROPWORK	F02
3B02	BRIDGE	WORKBY	F02
3B03	BRIDGE	IMPLEN	F05
3B04	BRIDGE	NBIMPCOST	F20
3B05	BRIDGE	NBIRWCOST	F21
3B06	BRIDGE	NBITOTCOST	F24
3B07	BRIDGE	NBIYRCOST	F01
4A15	BRIDGE	VCLROVER	B22
4A16	BRIDGE	REFVUC	
4A17	BRIDGE	VCLRUNDER	B22
4A18	BRIDGE	REFHUC	
4A19	BRIDGE	HCLRURT	B20
4A20	BRIDGE	HCLRULT	B20
4A21	BRIDGE	NAVCNTROL	D12
4A22	BRIDGE	NAVVC	D12
4A23	BRIDGE	NAVHC	D12
4A24	BRIDGE	LFTBRNAVCL	D12
4B01	BRIDGE	DESIGNLOAD	C03
4B02	BRIDGE	RATER_INI	
4B02	BRIDGE	RATINGDATE	
4B03	BRIDGE	POSTING	E29
4B04	BRIDGE	ORTYPE	E32
4B05	BRIDGE	ORLOAD	E31
4B06	BRIDGE	IRTYPE	E32
4B07	BRIDGE	IRLOAD	E30
4B08	BRIDGE	ALTORMETH	
4B09	BRIDGE	ALTORLOAD	
4B10	BRIDGE	ALTIRMETH	
4B11	BRIDGE	ALTIRLOAD	
4B12	BRIDGE	TRUCK1OR	
4B12	BRIDGE	TRUCK1IR	
4B13	BRIDGE	TRUCK2OR	
4B13	BRIDGE	TRUCK2IR	
5A01	BRIDGE	BRIDGE_ID	A01
5A02	BRIDGE	STRUCNAME	A06
5A03	BRIDGE	STRUCT_NUM	STRUCTURE_REF_NUM
5A03	BRIDGE	BRKEY	STRUCTURE_REF_NUM
5A04	BRIDGE	DISTRICT	
5A05	BRIDGE	COUNTY	A01
5A06	BRIDGE	PLACECODE	A09
5A07	BRIDGE	FEATINT	B32
5A08	BRIDGE	FACILITY	B33
5A09	BRIDGE	LOCATION	A06
5A10	BRIDGE	LATITUDE	A07
5A11	BRIDGE	LONGITUDE	A08
5A12	BRIDGE	BB_PCT	A04-B
5A12	BRIDGE	N_FHWA_REG	
5A12	BRIDGE	NSTATECODE	A04-A
5A13	BRIDGE	BB_BRDGEID	A04-C
5A14	BRIDGE	FHWA_REGN	A37
5A14	BRIDGE	FIPS_STATE	A37
5A15	BRIDGE	YEARBUILT	A16
5A16	BRIDGE	YEARRECON	A17

**Appendix E
Crystal Reports Tables for BMS Items**

BMS2Code	Table Name	COLUMN NAME	BMS Code
5A17	BRIDGE	SERVTYPON	A26
5A18	BRIDGE	SERVTYPUND	A26
5A19	BRIDGE	SUMLANES	B11
5A20	BRIDGE	CUSTODIAN	A23
5A21	BRIDGE	OWNER	A20
5A23	BRIDGE	ADMINAREA	
5B01	BRIDGE	DKSTRUCTYP	C09
5B02	BRIDGE	DKSURFTYPE	C10
5B03	BRIDGE	DKMEMBTYPE	C10
5B04	BRIDGE	DKPROTECT	C10
5B05, VI07	BRIDGE	LFTCURBSW	A34
5B06, VI08	BRIDGE	RTCURBSW	A34
5B07	BRIDGE	DECKWIDTH	A33
5B08	BRIDGE	BRIDGEMED	B10
5B09	BRIDGE	SKEW	B09
5B10	BRIDGE	STRFLARED	A32
5B11	BRIDGE	MAINSPANS	C16
5B12	BRIDGE	MATERIALMAIN	C05
5B13	BRIDGE	DESIGNMAIN	C05
5B14	BRIDGE	APPSPANS	C16
5B15	BRIDGE	MATERIALAPPR	C05
5B16	BRIDGE	DESIGNAPPR	C05
5B17	BRIDGE	MAXSPAN	C08
5B18, VS27	BRIDGE	LENGTH	T06, C07
5B19	BRIDGE	DECK_AREA	
5B20	BRIDGE	TOT_LENGTH	
5E01	BRIDGE	NBISLEN	C07-A
5E02	BRIDGE	PARALSTRUC	B10
5E03	BRIDGE	TEMPSTRUC	A27
5E04	BRIDGE	HISTSIGN	C01
5E10	BRIDGE	USERKEY1	
5E11	BRIDGE	USERKEY2	
5E12	BRIDGE	USERKEY3	
5E13	BRIDGE	USERKEY4	
5E14	BRIDGE	USERKEY5	
5E15	BRIDGE	USERKEY6	
5E16	BRIDGE	USERKEY7	
5E17	BRIDGE	USERKEY8	
5E24	BRIDGE	USERKEY15	
7A11	BRIDGE	NEXTINSPID	
7A12	BRIDGE	CREWHRS	E09
7A13	BRIDGE	SNOOPERHRS	E10
7A14	BRIDGE	BRIDGEGROUP	E02
7A15	BRIDGE	FLAGGERHRS	
7A16	BRIDGE	SPCREWHRS	
7A17	BRIDGE	HELPERHRS	
7A18	BRIDGE	SPEQUIPHRS	
IR01a	BRIDGE	REQ_OP_RAT	
	BRIDGE	DOCREFKEY	
	BRIDGE	OTHERLOAD	
1A10, 1B04	ELEMINS	QUANTITY	
1A11	ELEMINS	PCTSTATE1	
1A11	ELEMINS	PCTSTATE2	
1A11	ELEMINS	PCTSTATE3	

**Appendix E
Crystal Reports Tables for BMS Items**

BMS2Code	Table Name	COLUMN NAME	BMS Code
1A11	ELEMINSP	PCTSTATE4	
1A11	ELEMINSP	PCTSTATE5	
1A11	ELEMINSP	QTYSTATE1	
1A11	ELEMINSP	QTYSTATE2	
1A11	ELEMINSP	QTYSTATE3	
1A11	ELEMINSP	QTYSTATE4	
1A11	ELEMINSP	QTYSTATE5	
1A12	ELEMINSP	NOTES	
1B01	ELEMINSP	ELEMKEY	
1B02	ELEMINSP	STRUNITKEY	
1B03	ELEMINSP	ENVKEY	
1B05	ELEMINSP	ELEM_SCALE_FACTOR	
1B06	ELEMINSP	CITRIGGER	
1B07	ELEMINSP	DESCRIPTION	
5A03	ELEMINSP	BRKEY	STRUCTURE_REF_NUM
	ELEMINSP	INSPKEY	
	ELEMINSP	ELINSPDATE	
	ELEMINSP	ELCONDEST	
	ELEMINSP	DOCREFKEY	
	ELEMINSP	ELMROWIDKEY	
3A02	INSP_WCAND	WC_ID	
3A03	INSP_WCAND	STRUNITKEY	H03
5A03	INSP_WCAND	BRKEY	STRUCTURE_REF_NUM
IM01	INSP_WCAND	ACTKIND	
IM02	INSP_WCAND	OBJCODE	
IM03	INSP_WCAND	ACTCODE	H01
IM04	INSP_WCAND	ESTIMQUANTITY	H05
IM05	INSP_WCAND	AGENCY_PRIORITY	H08
IM06	INSP_WCAND	WORKRECDATE	H10
IM07	INSP_WCAND	AGENCY_STATUS	
IM08	INSP_WCAND	TARGETYEAR	H12
IM10, IM19	INSP_WCAND	ESTIMCOST	H06
IM11	INSP_WCAND	WORKASSIGNMENT	H09
IM15a, IM21	INSP_WCAND	NOTES	N03
	INSP_WCAND	DOCREFKEY	
	INSP_WCAND	FLAG_WHOLE	
	INSP_WCAND	INSPKEY	
	INSP_WCAND	OBJKIND	
	INSP_WCAND	REF_WITEMKEY	
	INSP_WCAND	STATE1	
	INSP_WCAND	STATE2	
	INSP_WCAND	STATE3	
	INSP_WCAND	STATE4	
	INSP_WCAND	STATE5	
	INSP_WCAND	WCKEY	
1A01	INSPEVNT	DKRATING	E17
1A02	INSPEVNT	SUBRATING	E20
1A03	INSPEVNT	CULVRATING	E22
1A04	INSPEVNT	SUPRATING	E18
1A05	INSPEVNT	CHANRATING	E21
1A06	INSPEVNT	WATERADEQ	E27
1A07	INSPEVNT	DECKDISTR	
1A09	INSPEVNT	INSPSTAT	
2A02, IW11, IS11	INSPEVNT	NOTES	T18

**Appendix E
Crystal Reports Tables for BMS Items**

BMS2Code	Table Name	COLUMN NAME	BMS Code
4A01, VP02	INSPEVNT	OPPOSTCL	D13
4A02	INSPEVNT	APPALIGN	E28
4A03, IA02	INSPEVNT	RAILRATING	E28-A
4A04, IA02	INSPEVNT	TRANSRATIN	E28-A
4A05, IA02	INSPEVNT	ARAILRATIN	E28-A
4A06, IA02	INSPEVNT	AENDRATING	E28-A
4A07	INSPEVNT	PIERPROT	D12-A
4A08	INSPEVNT	SCOURCRIT	E29-A, W06
4A08b	INSPEVNT	SCOUR_CRIT_CTGRY	
4A09	INSPEVNT	STRATING	E24
4A10	INSPEVNT	DECKGEOM	E25
4A11	INSPEVNT	UNDERCLR	E26
4A12	INSPEVNT	NBL_RATING	M08
4A13	INSPEVNT	SUFF_RATE	M05
4A14	INSPEVNT	CONDITION	
5A03	INSPEVNT	BRKEY	STRUCTURE_REF_NUM
7A01	INSPEVNT	INSPDATE	E06
7A02	INSPEVNT	INSPURKEY	
7A03, IW01	INSPEVNT	INSPTYPE	E07
7A04	INSPEVNT	REV_REQ	
7A05	INSPEVNT	INSPECTCONTROLID	E08
7A06	INSPEVNT	NBINSPDONE	W02
7A06	INSPEVNT	ELINSPDONE	W02
7A06	INSPEVNT	FCINSPDONE	W02
7A06	INSPEVNT	UWINSPDONE	W02
7A06	INSPEVNT	OSINSPDONE	W02
7A07	INSPEVNT	OSINSPREQ	
7A07	INSPEVNT	UWINSPREQ	
7A07	INSPEVNT	FCINSPREQ	
7A07	INSPEVNT	ELINSPREQ	
7A08	INSPEVNT	FCLASTINSP	
7A08	INSPEVNT	OSLASTINSP	
7A08	INSPEVNT	LASTINSP	
7A08	INSPEVNT	UWLASTINSP	
7A09	INSPEVNT	ELINSPREQ	E01
7A09	INSPEVNT	OSINSPREQ	E01
7A09	INSPEVNT	UWINSPREQ	W03
7A09	INSPEVNT	FCINSPREQ	J05
7A09, IS13, IW13	INSPEVNT	BRINSPREQ	E01
7A10	INSPEVNT	ELNEXTDATE	E05
7A10	INSPEVNT	FCNEXTDATE	E05
7A10	INSPEVNT	OSNEXTDATE	E05
7A10	INSPEVNT	UWNEXTDATE	E05
7A10, IW14, IS14	INSPEVNT	NEXTINSP	E05
	INSPEVNT	DOCREFKEY	
	INSPEVNT	INSPKEY	
IM18	PRJ_WITEMS	QUANTITY	N05
5A03	ROADWAY	BRKEY	STRUCTURE_REF_NUM
5C01, FW01	ROADWAY	ROADWAY_NAME	D06, B03
5C03	ROADWAY	ON_UNDER	B01, B04
5C04	ROADWAY	KIND_HWY	B07, R03
5C05	ROADWAY	LEVL_SRVC	B08
5C06	ROADWAY	DIRSUFFIX	B06
5C06	ROADWAY	ROUTENUM	B05, R03

**Appendix E
Crystal Reports Tables for BMS Items**

BMS2Code	Table Name	COLUMN NAME	BMS Code
5C08, FR07	ROADWAY	LANES	B11
5C08	ROADWAY	NUM_MEDIAN	
5C08	ROADWAY	ROAD_SPEED	
5C09	ROADWAY	ADTCLASS	
5C10	ROADWAY	ADTTOTAL	B27, R04
5C11	ROADWAY	ADTYEAR	B28, R05
5C12	ROADWAY	ADTFUTURE	F10
5C13	ROADWAY	ADTFUTYEAR	F11
5C14	ROADWAY	TRUCKPCT	B30A, R07-A
5C15	ROADWAY	BYPASSLEN	A35
5C16	ROADWAY	DET_SPEED	
5C17	ROADWAY	ACC_RATE	
5C17	ROADWAY	TEN_YR_CNT	
5C18	ROADWAY	KMPOST	
5C19	ROADWAY	ONBASENET	
5C20	ROADWAY	LRVINVRT	
5C20	ROADWAY	SUBRTNUM	
5C21	ROADWAY	TOLLFAC	A25
5C22, IL04	ROADWAY	FUNCCCLASS	B18, R10
5C23	ROADWAY	TRAFFICDIR	
5C24	ROADWAY	VCLRINV	B23
5C25	ROADWAY	HCLRINV	
5C26	ROADWAY	AROADWIDTH	A30
5C27	ROADWAY	ROADWIDTH	A31
5C28	ROADWAY	DEFHWY	B24
5C29	ROADWAY	NHS_IND	B17-A
5C30	ROADWAY	SCHOOL_BUS	A18
5C31	ROADWAY	FEDLANDHWY	
5C32	ROADWAY	TRANSIT_RT	A19
5C33	ROADWAY	TRUCKNET	B19-A
5C34	ROADWAY	CRIT_TRAV	
5C36	ROADWAY	ON_UNDER_ADJ	
FR16, FW20	ROADWAY	NOTES	
	ROADWAY	DOCREFKEY	
5A03	STRUCTURE_UNIT	BRKEY	STRUCTURE_REF_NUM
5D01	STRUCTURE_UNIT	STRUNITKEY	
5D02, SP02	STRUCTURE_UNIT	STRUNITLABEL	J09, W09
5D03, SP06	STRUCTURE_UNIT	STRUNITDESCRIPTION	
5D04, SP01	STRUCTURE_UNIT	STRUNITTYPE	J09
5D05	STRUCTURE_UNIT	DEFAULTFLAG	
	STRUCTURE_UNIT	DOCREFKEY	
	STRUCTURE_UNIT	NOTES	
5A03	T_APRAS_CLEAR	BRKEY	STRUCTURE_REF_NUM
SC02	T_APRAS_CLEAR	ON_UNDER	PB08
SC03	T_APRAS_CLEAR	ON_WEIGHT_COND1	PB12
SC03	T_APRAS_CLEAR	ON_WEIGHT_COND2	PB17
SC03	T_APRAS_CLEAR	ON_WEIGHT_COND3	PB13
SC03	T_APRAS_CLEAR	UNDER_CLEAR_COND1	PB14
SC03	T_APRAS_CLEAR	UNDER_CLEAR_COND2	PB15
SC03	T_APRAS_CLEAR	ON_CLEAR_COND1	PB18
SC03	T_APRAS_CLEAR	ON_CLEAR_COND2	PB16
SC05	T_APRAS_CLEAR	NON_RES_VERT_CLEAR	PB10
SC06	T_APRAS_CLEAR	NON_RES_REVIEW	
SC07	T_APRAS_CLEAR	MIN_TRAVEL_WIDTH_LEFT	PB13

**Appendix E
Crystal Reports Tables for BMS Items**

BMS2Code	Table Name	COLUMN NAME	BMS Code
SC08	T_APRAS_CLEAR	MIN_TRAVEL_WIDTH_RIGHT	PB13
	T_APRAS_CLEAR	APRAS_SPAN_KEY	
5A03	T_APRAS_CLEAR_DETAIL	BRKEY	STRUCTURE_REF_NUM
SC09	T_APRAS_CLEAR_DETAIL	HOR_CLEAR	PB11
SC10	T_APRAS_CLEAR_DETAIL	VERT_CLEAR	PB11
	T_APRAS_CLEAR_DETAIL	APRAS_SPAN_KEY	
	T_APRAS_CLEAR_DETAIL	CLEARKEY	
	T_APRAS_CLEAR_DETAIL	ON_UNDER	
5A03	T_APRAS_NARRATIVE	BRKEY	STRUCTURE_REF_NUM
SC04	T_APRAS_NARRATIVE	CONDITION_NARRATIVE	PB14
	T_APRAS_NARRATIVE	APRAS_SPAN_KEY	
	T_APRAS_NARRATIVE	NARRATIVE_KEY	
5A03	T_APRAS_RATING	BRKEY	STRUCTURE_REF_NUM
SL01	T_APRAS_RATING	RATING_DATE	PC08
SL02	T_APRAS_RATING	MOMENT_NORMAL	PB03
SL03	T_APRAS_RATING	MOMENT_SINGLE	PB03
SL04	T_APRAS_RATING	SHEAR_NORMAL	PB04
SL05	T_APRAS_RATING	SHEAR_SINGLE	PB04
SL06	T_APRAS_RATING	POS_MOM_COMP_FACTOR_NORM	PB05
SL07	T_APRAS_RATING	POS_MOM_COMP_FACTOR_REST	PB05
SL08	T_APRAS_RATING	NEG_MOM_COMP_FACTOR_NORM	PB06
SL09	T_APRAS_RATING	NEG_MOM_COMP_FACTOR_REST	PB06
SL10	T_APRAS_RATING	LOAD_COND1	PB07
SL10	T_APRAS_RATING	LOAD_COND2	PB07
SL11	T_APRAS_RATING	SINGLE_LANE_SPAN_ID	PA11
SL12	T_APRAS_RATING	RESTRICT_SPAN_ID1	PC12
SL13	T_APRAS_RATING	RESTRICT1	PC13
SL13	T_APRAS_RATING	RESTRICT2	PC13
SL13	T_APRAS_RATING	RESTRICT3	PC13
SL14	T_APRAS_RATING	RESTRICT_SPAN_ID2	PC14
SL15	T_APRAS_RATING	RESTRICT4	PC15
SL15	T_APRAS_RATING	RESTRICT5	PC15
SL15	T_APRAS_RATING	RESTRICT6	PC15
SL15	T_APRAS_RATING	RESTRICT7	PC15
SL16	T_APRAS_RATING	RATING_NOTES	PC11
5A03	T_APRAS_SPAN	BRKEY	STRUCTURE_REF_NUM
SS01, SC01	T_APRAS_SPAN	SPAN_ID_SUFFIX	PA04
SS02	T_APRAS_SPAN	STRUNITKEY	
SS03	T_APRAS_SPAN	BACKSPAN	PA04
SS04	T_APRAS_SPAN	IDENTICAL_SPAN_NO	PA05
SS05	T_APRAS_SPAN	BEGIN_CONTINUOUS	PA06
SS06	T_APRAS_SPAN	END_CONTINUOUS	PA06
SS07	T_APRAS_SPAN	C_C_SPAN_LENGTH	PA08
SS08	T_APRAS_SPAN	MOM_COMP_SPAN_LENGTH	PA10
SS09	T_APRAS_SPAN	DEPT_STRUC_CONFIG	PA09
SS09	T_APRAS_SPAN	DEPT_PHYSICAL_TYPE	PA09
SS09	T_APRAS_SPAN	DEPT_SPAN_INTERACTION	PA09
SS09	T_APRAS_SPAN	DEPT_MATERIAL_TYPE	PA09
SS10	T_APRAS_SPAN	NOTES	
	T_APRAS_SPAN	APRAS_SPAN_KEY	
5A03	T_BEARING_TYPE	BRKEY	STRUCTURE_REF_NUM
VD30	T_BEARING_TYPE	BEARING_TYPEKEY	
VD30	T_BEARING_TYPE	BEARING_TYPE	C23
5A03	T_BRIDGE_ASSIGNMENT	BRKEY	

**Appendix E
Crystal Reports Tables for BMS Items**

BMS2Code	Table Name	COLUMN NAME	BMS Code
	T_BRIDGE_ASSIGNMENT	ASSIGN_TYPE_KEY	
	T_BRIDGE_ASSIGNMENT	BP_ID	
	T_COUNTY	COUNTY	
	T_COUNTY	PENNDOT_COUNTY	
	T_COUNTY	PLAN_PARTNER	
	T_COUNTY	SAP_ORG_CODE	
	T_COUNTY_DISTRICT	DISTRICT	
	T_COUNTY_DISTRICT	PENNDOT_COUNTY	
5A03	T_CULVERT_OPENING	BRKEY	STRUCTURE_REF_NUM
VD18	T_CULVERT_OPENING	OPENING_TYPE	
VD19	T_CULVERT_OPENING	CULVERT_LENGTH	C06
VD20	T_CULVERT_OPENING	MIN_FILL_HEIGHT	
VD21	T_CULVERT_OPENING	MAX_FILL_HEIGHT	
VD22	T_CULVERT_OPENING	EFF_WIDTH	
VD23	T_CULVERT_OPENING	TIE_TYPE	C42
VD24	T_CULVERT_OPENING	FLOOR_TYPE	
	T_CULVERT_OPENING	OPENING_KEY	
	T_DECK_TYPE	DEPT_DKSTRUCTYP	
	T_DECK_TYPE	FWHA_DKSTRUCTYP	
5A03	T_DESIGN_EXCEPTION	BRKEY	STRUCTURE_REF_NUM
VN01	T_DESIGN_EXCEPTION	DESIGN_EXCEPTION	A12-A
5A03	T_DRAWING	BRKEY	STRUCTURE_REF_NUM
VN05	T_DRAWING	DRAWING_TYPE	A14
VN06	T_DRAWING	DRAWING_NUM	A15
VN07	T_DRAWING	DRAWING_DESC	G07
	T_DRAWING	DRAWING_KEY	
5A03	T_EXP_JOINT	BRKEY	STRUCTURE_REF_NUM
VD25	T_EXP_JOINT	EXP_JOINT_TYPE	C22
VD26	T_EXP_JOINT	MOVEMENT_CLASS	C22
VD27	T_EXP_JOINT	MANUFACTURE_CODE	C22
	T_EXP_JOINT	EXP_JOINT_KEY	
5A03	T_FC_INSP	BRKEY	STRUCTURE_REF_NUM
IF01	T_FC_INSP	STRUNITKEY	J09
IF02	T_FC_INSP	FC_MEM_TYPE	
IF03	T_FC_INSP	FC_MEM	J10
IF04	T_FC_INSP	FC_DETAIL	J11
IF05	T_FC_INSP	FATIG_STRESS_CAT	J11-A
IF06	T_FC_INSP	FC_DESC	J12
	T_FC_INSP	FC_KEY	
	T_FC_INSP	INSPKEY	
SG01	T_GROUP	TYPECODE	
SG02	T_GROUP	NAME	
SG03	T_GROUP	GROUPID	
SG05	T_GROUP	DESCRIPTION	
	T_GROUP_STRUCTURE	BRKEY	
SG03	T_GROUP_STRUCTURE	GROUPID	
SG04	T_GROUP_STRUCTURE	RELATIONCD	
5A03	T_INSP_COMMENT	BRKEY	STRUCTURE_REF_NUM
IC01	T_INSP_COMMENT	COMMENT_TYPE	
IC02_IL08	T_INSP_COMMENT	NOTES	
	T_INSP_COMMENT	INSPKEY	
5A03	T_INSP_DEFECT	BRKEY	STRUCTURE_REF_NUM
	T_INSP_DEFECT	DEFECT	
	T_INSP_DEFECT	DEFECT_DESC	

**Appendix E
Crystal Reports Tables for BMS Items**

BMS2Code	Table Name	COLUMN NAME	BMS Code
	T_INSP_DEFECT	DEFECT_KEY	
	T_INSP_DEFECT	DEFECT_LOC	
	T_INSP_DEFECT	INSPKEY	
5A03	T_INSP_EQUIP	BRKEY	STRUCTURE_REF_NUM
VI12	T_INSP_EQUIP	EQUIP_TYPE	E03, S04
VI13	T_INSP_EQUIP	EQUIP_QTY	
VI14	T_INSP_EQUIP	CONSUMABLE	
VI15	T_INSP_EQUIP	ASSIGNED_TO	
VI16	T_INSP_EQUIP	NOTES	
	T_INSP_EQUIP	EQUIP_KEY	
5A03	T_INSP_PERMIT	BRKEY	STRUCTURE_REF_NUM
VI18	T_INSP_PERMIT	PERMIT_TYPE	
VI20	T_INSP_PERMIT	POC	
VI21	T_INSP_PERMIT	PHONE_NUM	
VI22	T_INSP_PERMIT	FAX_NUM	
VI23	T_INSP_PERMIT	EMAIL_ADDR	
VI24	T_INSP_PERMIT	NOTES	
	T_INSP_PERMIT	PERMIT_KEY	
5A03	T_INSP_STATUS_AUDIT	BRKEY	STRUCTURE_REF_NUM
	T_INSP_STATUS_AUDIT	CHANGED_INSP_STATUS	
	T_INSP_STATUS_AUDIT	INSPKEY	
5A03	T_MAINT_RESP	BRKEY	STRUCTURE_REF_NUM
VM03	T_MAINT_RESP	AGENCY_RESP	A23
VM04	T_MAINT_RESP	PORTION_RESP	A23
VM05	T_MAINT_RESP	PSC_PUC_NUM	A13
VM06	T_MAINT_RESP	ORDER_ENTERED_DATE	
VM07	T_MAINT_RESP	NOTES	
	T_MAINT_RESP	MAINT_RESP_KEY	
5A03	T_PAINT	BRKEY	STRUCTURE_REF_NUM
VA01	T_PAINT	PAINT_DATE	G09
VA02	T_PAINT	EXTENT	E19, G16
VA03	T_PAINT	STEEL_PAINTED	G10
VA04	T_PAINT	EST_SURFACE_AREA	G11
VA05	T_PAINT	PRIMER_TYPE	G16
VA06	T_PAINT	INTERM_TYPE	G16
VA07	T_PAINT	FINISH_TYPE	G16
VA08	T_PAINT	COLOR	G14
VA09	T_PAINT	COATS_APPLIED_QTY	G12
VA10	T_PAINT	THICKNESS	G16
VA11	T_PAINT	AMOUNT_APPLIED	G13
VA12	T_PAINT	CLEANING_TYPE	G15
VA13	T_PAINT	PAINTING_COST	G17
VA14	T_PAINT	NOTES	
	T_PAINT	PAINT_KEY	
5A03	T_PIER_FOUND_TYPE	BRKEY	STRUCTURE_REF_NUM
VD17	T_PIER_FOUND_TYPE	PIER_FOUND_TYPE	C40
	T_PIER_FOUND_TYPE	PIER_FOUND_TYPE_KEY	
5A03	T_PIER_TYPE	BRKEY	STRUCTURE_REF_NUM
VD16	T_PIER_TYPE	PIER_CONFIG_TYPE	C39
VD16	T_PIER_TYPE	PIER_MATERIAL_TYPE	C39
	T_PIER_TYPE	PIER_TYPE_KEY	
5A03	T_POSTING	BRKEY	STRUCTURE_REF_NUM
L.5	T_POSTING	POST_STATUS	
VP01	T_POSTING	POST_STATUS_DATE	D16, D17

**Appendix E
Crystal Reports Tables for BMS Items**

BMS2Code	Table Name	COLUMN NAME	BMS Code
VP02	T_POSTING	POST_STATUS	D13
VP03	T_POSTING	SPEC_RESTRICT_POST	D14
VP04	T_POSTING	POST_LIMIT_WEIGHT	D15
VP05	T_POSTING	POST_LIMIT_COMB	D15
VP06	T_POSTING	POST_REASON	D18
VP07	T_POSTING	FIELD_COND	D19
VP08	T_POSTING	SPEC_COND	D20
VP09	T_POSTING	IMPACT	D21
VP10	T_POSTING	PERMANENTLY_CLOSED_STRUC	
	T_POSTING	ACTIVE	
	T_POSTING	POSTING_KEY	
FR17	T_RAILROAD_GC	RRDIV	
FR18	T_RAILROAD_GC	RRSUBDIV	
FR19	T_RAILROAD_GC	BRANCH	
FR20	T_RAILROAD_GC	RAILROAD_OPERATOR	
5A03	T_RATING_LOAD	BRKEY	STRUCTURE_REF_NUM
IR03	T_RATING_LOAD	RATING_DATE	
IR04	T_RATING_LOAD	LOAD_TYPE	E30, E31
IR05	T_RATING_LOAD	NBI_RATING_IND	
IR06	T_RATING_LOAD	RATING_ANALYSIS_METHOD	E32
IR07	T_RATING_LOAD	CONTROL_MEM_TYPE	E33, PC03
IR08	T_RATING_LOAD	FATIG_STRESS_CAT	E34, PC06
IR09	T_RATING_LOAD	FATIG_LOAD_TYPE	E35
IR10	T_RATING_LOAD	IRLOAD	E30, PC09
IR11	T_RATING_LOAD	ORLOAD	E31, PC10
IR11a	T_RATING_LOAD	SLC_RATING	
IR12	T_RATING_LOAD	INV_RATING_STRESS_METHOD	E32
IR13	T_RATING_LOAD	OPR_RATING_STRESS_METHOD	E32
IR14	T_RATING_LOAD	AASHTO_MANUAL_YEAR	E38
IR15	T_RATING_LOAD	AASHTO_SPEC_YEAR	E37, PC04
IR16	T_RATING_LOAD	ANALYSIS_ENGINEER	
IR17	T_RATING_LOAD	SUPPORT_DATASET	
IR18	T_RATING_LOAD	STRESS_RANGE	E36
IR19	T_RATING_LOAD	NOTES	
IR20	T_RATING_LOAD	IR_LOAD_FACTOR	
IR21	T_RATING_LOAD	OR_LOAD_FACTOR	
	T_RATING_LOAD	RATING_KEY	
5A03	T_SAFETY_FEATURE	BRKEY	STRUCTURE_REF_NUM
IA01	T_SAFETY_FEATURE	LOCATION	
IA03	T_SAFETY_FEATURE	SF_DESC	
	T_SAFETY_FEATURE	INSPKEY	
	T_SAFETY_FEATURE	SAFETY_FEATURE_TYPE	
IM16	T_SAP_WITEMS	SCHED_CLOSE_DATE	
IM17	T_SAP_WITEMS	SAP_WORK_ORDER_NUM	
5A03	T_SCOUR_CMEASURE	BRKEY	STRUCTURE_REF_NUM
IU21	T_SCOUR_CMEASURE	CMEASURE_TYPE	
IU22	T_SCOUR_CMEASURE	CMEASURE_LOCATION	
IU23	T_SCOUR_CMEASURE	CMEASURE_COND	
IU24	T_SCOUR_CMEASURE	PIER_NUM	
	T_SCOUR_CMEASURE	CMEASURE_KEY	
	T_SCOUR_CMEASURE	INSPKEY	
5A03	T_SCOUR_COMP	BRKEY	STRUCTURE_REF_NUM
IL02	T_SCOUR_COMP	OVERTOP_RISK	E27
IL03	T_SCOUR_COMP	TRAFFIC_DELAY	E27

**Appendix E
Crystal Reports Tables for BMS Items**

BMS2Code	Table Name	COLUMN NAME	BMS Code
IL05	T_SCOUR_COMP	HIGH_WATER_ELEV	
IL06	T_SCOUR_COMP	HIGH_WATER_DATE	
IL07	T_SCOUR_COMP	NEW_HIGH_WATER	
IL13	T_SCOUR_COMP	OVERTOPPING	
IL14	T_SCOUR_COMP	OVERTOP_DATE	
IU00a	T_SCOUR_COMP	REVIEWER_ACTION	
IU00b	T_SCOUR_COMP	REVIEWER_COMMENT	
IU01	T_SCOUR_COMP	SCOUR_RECALC	
IU02	T_SCOUR_COMP	UNITS_INSPECTED_QTY	W14
IU03	T_SCOUR_COMP	SCBI_SOURCE	
IU04	T_SCOUR_COMP	OVERALL_OSA	
IU04b	T_SCOUR_COMP	SCOUR_CALCULATED	
IU05	T_SCOUR_COMP	OVERALL_SAR	
IU06	T_SCOUR_COMP	STREAM_BED_MATERIAL_1	W07
IU06	T_SCOUR_COMP	STREAM_BED_MATERIAL_2	W07
IU07	T_SCOUR_COMP	STREAM_BED_MATERIAL_DESC	W07
IU08	T_SCOUR_COMP	DEBRIS_POTENTIAL	
IU09	T_SCOUR_COMP	TRAPPING_POTENTIAL	
IU10	T_SCOUR_COMP	PRESSURE_FLOW	
IU11	T_SCOUR_COMP	NAB_LOCATION	
IU12	T_SCOUR_COMP	FAB_LOCATION	
IU13	T_SCOUR_COMP	US_LEFT_WW_PRESENCE	
IU14	T_SCOUR_COMP	US_LEFT_WW_COND	
IU15	T_SCOUR_COMP	US_RIGHT_WW_PRESENCE	
IU16	T_SCOUR_COMP	US_RIGHT_WW_COND	
IU17	T_SCOUR_COMP	HOR_DEBRIS_START_PCT	
IU18	T_SCOUR_COMP	HOR_DEBRIS_END_PCT	
IU19	T_SCOUR_COMP	VERT_DEBRIS_START_PCT	
IU20	T_SCOUR_COMP	VERT_DEBRIS_END_PCT	
	T_SCOUR_COMP	INSPKEY	
5A03	T_SCOUR_POSS_CMEASURE	BRKEY	STRUCTURE_REF_NUM
IU25	T_SCOUR_POSS_CMEASURE	LOCATION	
IU26	T_SCOUR_POSS_CMEASURE	WCKEY	
	T_SCOUR_POSS_CMEASURE	INSPKEY	
	T_SCOUR_POSS_CMEASURE	PCM_KEY	
5A03	T_SIGN_LIGHT	BRKEY	STRUCTURE_REF_NUM
6C01	T_SIGN_LIGHT	PA_COUNTY	
6C02	T_SIGN_LIGHT	SR_NUM	
6C03	T_SIGN_LIGHT	SEG_NUM	
6C04	T_SIGN_LIGHT	OFFSET	
VS05	T_SIGN_LIGHT	MOUNT_TYPE	
VS06	T_SIGN_LIGHT	FOUND_MATERIAL_TYPE	
VS07	T_SIGN_LIGHT	MANUFACTURER	
VS08	T_SIGN_LIGHT	INSP_LOC	
VS11	T_SIGN_LIGHT	SIGN_QTY	S13
VS12	T_SIGN_LIGHT	LIGHT_QTY	S06
VS17	T_SIGN_LIGHT	ROAD_DISTANCE	
VS18	T_SIGN_LIGHT	ROAD_SIDE	
VS19	T_SIGN_LIGHT	MAX_TOWER_DIAMETER	
VS20	T_SIGN_LIGHT	MIN_TOWER_DIAMETER	
VS21	T_SIGN_LIGHT	MOUNT_BOLT_BASE	
VS22	T_SIGN_LIGHT	HEIGHT	
VS23	T_SIGN_LIGHT	LEAN_MOVEMENT	
VS24	T_SIGN_LIGHT	LEAN_ALIGNMENT	

**Appendix E
Crystal Reports Tables for BMS Items**

BMS2Code	Table Name	COLUMN NAME	BMS Code
VS25	T_SIGN_LIGHT	TOT_SIGN_AREA	S05
VS26	T_SIGN_LIGHT	MAX_COLUMN_HEIGHT	S19
VS28	T_SIGN_LIGHT	SPAN_QTY	S20
VS30	T_SIGN_LIGHT	MEDIAN_WIDTH	S21-A
VS34	T_SIGN_LIGHT	MSG_SIGN	
5A03	T_SIGN_LIGHT_INSP	BRKEY	STRUCTURE_REF_NUM
IS01	T_SIGN_LIGHT_INSP	SIGN_INSP_TYPE	E07, S01A
IS02	T_SIGN_LIGHT_INSP	BASE_COND_RATE	S22
IS03	T_SIGN_LIGHT_INSP	GRAIL_COND_RATE	S23
IS04	T_SIGN_LIGHT_INSP	COLUMN_COND_RATE	S24
IS05	T_SIGN_LIGHT_INSP	ACCESS_COND_RATE	S25
IS06	T_SIGN_LIGHT_INSP	SIGN_COND_RATE	S26
IS07	T_SIGN_LIGHT_INSP	LIGHT_COND_RATE	S27
IS08	T_SIGN_LIGHT_INSP	SURFACE_COND_RATE	S28
IS09	T_SIGN_LIGHT_INSP	HOR_COND_RATE	S29
IS10	T_SIGN_LIGHT_INSP	STRRATING	S30
IS12	T_SIGN_LIGHT_INSP	NEXT_SIGN_INSP_TYPE	S02-A
IS15	T_SIGN_LIGHT_INSP	SIGN_ASSET_TAG	
	T_SIGN_LIGHT_INSP	INSPKEY	
5A03	T_SIGNING	BRKEY	STRUCTURE_REF_NUM
ID01	T_SIGNING	SIGN_TYPE	
ID02	T_SIGNING	SIGN_NEEDED	
ID03	T_SIGNING	SIGN_MESSAGE	
ID04	T_SIGNING	NEAR_ADVANCE_COND	
ID05	T_SIGNING	FAR_ADVANCE_COND	
ID06	T_SIGNING	NEAR_SITE_COND	
ID07	T_SIGNING	FAR_SITE_COND	
ID08	T_SIGNING	NOTES	
	T_SIGNING	INSPKEY	
5A03	T_STEEL_TYPE	BRKEY	STRUCTURE_REF_NUM
VD05	T_STEEL_TYPE	STEEL_TYPE	C12
	T_STEEL_TYPE	STEEL_TYPE_KEY	
5A03	T_STRAND_SIZE	BRKEY	STRUCTURE_REF_NUM
VD13	T_STRAND_SIZE	STRAND_SIZE	C28
	T_STRAND_SIZE	STRAND_SIZE_KEY	
	T_STRUC_DESIGN_TYPE	DEPT_SPAN_INTERACTION	
	T_STRUC_DESIGN_TYPE	DEPT_STRUC_CONFIG	
	T_STRUC_DESIGN_TYPE	FHWA_DESIGN_TYPE	
	T_STRUC_MATERIAL_TYPE	DEPT_SPAN_INTERACTION	
	T_STRUC_MATERIAL_TYPE	DEPT_MATERIAL_TYPE	
	T_STRUC_MATERIAL_TYPE	FHWA_MATERIAL_TYPE	
5A03	T_STRUC_UNIT_INSP_COMMENT	BRKEY	STRUCTURE_REF_NUM
IC03	T_STRUC_UNIT_INSP_COMMENT	STRUNITKEY	
IC04	T_STRUC_UNIT_INSP_COMMENT	COMMENT_TYPE	
IC05	T_STRUC_UNIT_INSP_COMMENT	NOTES	
	T_STRUC_UNIT_INSP_COMMENT	INSPKEY	
I.15	T_TUNNEL_IDENTIFY	BORDER_ST_CODE	
I.16	T_TUNNEL_IDENTIFY	BORDER_FIN_RESP	
I.17	T_TUNNEL_IDENTIFY	BORDER_NUMBER	
I.18	T_TUNNEL_IDENTIFY	BORDER_INSP_RESP	
L.2	T_TUNNEL_LOAD_RATING	RATING_METHOD	
L.3	T_TUNNEL_LOAD_RATING	INV_LR_FACTOR	
L.4	T_TUNNEL_LOAD_RATING	OP_LR_FACTOR	
L.6	T_TUNNEL_LOAD_RATING	GROSS_POST_LOAD	

**Appendix E
Crystal Reports Tables for BMS Items**

BMS2Code	Table Name	COLUMN NAME	BMS Code
L.7	T_TUNNEL_LOAD_RATING	AXLE_POST_LOAD	
L.8	T_TUNNEL_LOAD_RATING	TYPE3_POST_LOAD	
L.9	T_TUNNEL_LOAD_RATING	TYPE3_3_POST_LOAD	
L.10	T_TUNNEL_LOAD_RATING	HEIGHT_RESTR	
L.11	T_TUNNEL_LOAD_RATING	HAZMAT_RESTR	
L.12	T_TUNNEL_LOAD_RATING	OTHER_RESTR	
N.1	T_TUNNEL_NAV	UNDER_NAV_WATERWAY	
N.2	T_TUNNEL_NAV	NAV_WATERWAY_CLRNC	
N.3	T_TUNNEL_NAV	PROTECT_FM_NAV	
A.8	T_TUNNEL_SERVICE	SVC_IN_TUNNEL	
C.3	T_TUNNEL_SERVICE	DIR_OF_TRAFFIC	
C.4	T_TUNNEL_SERVICE	TOLL	
C.7	T_TUNNEL_SERVICE	FUNCTIONAL_CLASS	
C.8	T_TUNNEL_SERVICE	URBAN_CODE	
S.1	T_TUNNEL_STRUCTMAT	NUM_BORES	
S.2	T_TUNNEL_STRUCTMAT	TUNNEL_SHAPE	
S.3	T_TUNNEL_STRUCTMAT	PORTAL_SHAPE	
S.4	T_TUNNEL_STRUCTMAT	GROUND_CONDTN	
S.5	T_TUNNEL_STRUCTMAT	COMPLEX	
5A03	T_UNDERWATER_INSP	BRKEY	STRUCTURE_REF_NUM
IN01	T_UNDERWATER_INSP	STRUNITKEY	W09
IN02	T_UNDERWATER_INSP	PREVIOUS_CURRENT	W13
IN03	T_UNDERWATER_INSP	OBS_SCOUR_RATING	W11-A
IN04	T_UNDERWATER_INSP	CHG_SINCE_LAST_INSP	
IN05	T_UNDERWATER_INSP	SCOUR_HOLE	
IN06	T_UNDERWATER_INSP	DEBRIS_POTENTIAL	
IN07	T_UNDERWATER_INSP	SUB_SCOUR	
IN08	T_UNDERWATER_INSP	OPEN_ADEQ_CHANNEL	
IN09	T_UNDERWATER_INSP	SED_DEPOSIT	
IN10	T_UNDERWATER_INSP	ALIGNMENT	
IN11	T_UNDERWATER_INSP	VELO_STREAM_SLOPE	
IN12	T_UNDERWATER_INSP	SUBUNIT_TYPE	
IN13	T_UNDERWATER_INSP	INV_FOUND_TYPE	W10
IN14	T_UNDERWATER_INSP	FOUND_TYPE	W10
IN15	T_UNDERWATER_INSP	STREAM_BED_MATERIAL	W07
IN16	T_UNDERWATER_INSP	UNDERWATER_INSP_TYPE	W11-B
IN17	T_UNDERWATER_INSP	OBS_SCOUR_DEPTH	W11-C
IN18	T_UNDERWATER_INSP	MAX_WATER_DEPTH	W11
IN19	T_UNDERWATER_INSP	MOVEMENT	
IN20	T_UNDERWATER_INSP	SCOUR_UNDERMINE	
IN21	T_UNDERWATER_INSP	COUNTERMEASURES	W11-F
IN22	T_UNDERWATER_INSP	CALC_SCOUR_DEPTH_100	W11-D
IN23	T_UNDERWATER_INSP	CALC_SCOUR_DEPTH_500	W11-E
IN24	T_UNDERWATER_INSP	UNDERWATER_INSP_DESC	W12
IU27	T_UNDERWATER_INSP	SCBL_CODE	
IU28	T_UNDERWATER_INSP	SCBL_CASE	
	T_UNDERWATER_INSP	INSPKEY	
IM05b	T_USERINSP_WCAND	PRIORITY_CHANGE_DATE	
IM09	T_USERINSP_WCAND	LOCATION	H03
IM12	T_USERINSP_WCAND	DRAWING_IND	
IM13	T_USERINSP_WCAND	PERMIT_IND	
IM14a	T_USERINSP_WCAND	COMPLETED_DATE	N01
IM14b	T_USERINSP_WCAND	POA_DATE	
IM14c	T_USERINSP_WCAND	MITIGATION_DATE	

**Appendix E
Crystal Reports Tables for BMS Items**

BMS2Code	Table Name	COLUMN NAME	BMS Code
IM15b	T_USERINSP_WCAND	DEFERRED_ACTION_DESC	
IM15c	T_USERINSP_WCAND	BRIDGE_APPROVAL	
IM15d	T_USERINSP_WCAND	MAINT_APPROVAL	
IM15e	T_USERINSP_WCAND	CO_APPROVAL	
	T_USERINSP_WCAND	WCKEY	
5A03	T_UTILITY	BRKEY	STRUCTURE_REF_NUM
FT01	T_UTILITY	UTILITY_NAME	D02
FT02	T_UTILITY	UTILITY_TYPE	
FT03	T_UTILITY	LICENSE_NUM	D03
FT04	T_UTILITY	LICENSE_ISSUE_DATE	D04
FT05	T_UTILITY	UTILITY_WEIGHT	D05
FT06	T_UTILITY	UTILITY_ADDR	D02
FT07	T_UTILITY	HAZMAT	
FT08	T_UTILITY	LOCATION_DESC	
FT09	T_UTILITY	CONTACT_DESC	
FT10	T_UTILITY	NOTES	
	T_UTILITY	UTILITY_KEY	D01
5A03	T_UW_UNDERCLEAR	BRKEY	STRUCTURE_REF_NUM
IL09	T_UW_UNDERCLEAR	ORIGIN	
IL10	T_UW_UNDERCLEAR	HOR_DISTANCE	
IL11	T_UW_UNDERCLEAR	VERT_UNDERCLEAR	
IL12	T_UW_UNDERCLEAR	NOTES	
	T_UW_UNDERCLEAR	INSPKEY	
	T_UW_UNDERCLEAR	UNDERCLEAR_KEY	
5A03	T_VOID_TYPE	BRKEY	STRUCTURE_REF_NUM
VD12	T_VOID_TYPE	VOID_TYPE	C33
	T_VOID_TYPE	VOID_TYPE_KEY	
5A03	T_WALL	BRKEY	STRUCTURE_REF_NUM
VW05	T_WALL	FOUND_TYPE	
VW06	T_WALL	BACKFILL_MATERIAL1	T11
VW07	T_WALL	BACKFILL_MATERIAL2	T11
VW08	T_WALL	HIST_ELIG	
VW09	T_WALL	MANUFACTURER	
VW10	T_WALL	WALL_USE	T10
VW11	T_WALL	MOUNT_TYPE	
VW12	T_WALL	POST_TYPE	
VW15	T_WALL	ARCH_FORMS	
VW16	T_WALL	REBAR_TYPE	
VW17	T_WALL	FCI	
VW18	T_WALL	SUPPORT_DESC	
VW19	T_WALL	ROAD_SIDE	
VW20	T_WALL	INSTALL_ROADWAY_TYPE	
VW21	T_WALL	BEGIN_COUNTY	A01
VW21	T_WALL	END_COUNTY	
VW22	T_WALL	BEGIN_ROUTENUM	A01
VW22	T_WALL	END_ROUTENUM	
VW23	T_WALL	BEGIN_SEG_NUM	A01
VW23	T_WALL	END_SEG_NUM	
VW24	T_WALL	BEGIN_OFFSET	A01
VW24	T_WALL	END_OFFSET	
VW25	T_WALL	ROAD_DISTANCE	
VW26	T_WALL	BACKFILL_SLOPE	T12
VW27	T_WALL	MIN_CLEARANCE	
VW28	T_WALL	MIN_HEIGHT	T04

**Appendix E
Crystal Reports Tables for BMS Items**

BMS2Code	Table Name	COLUMN NAME	BMS Code
VW29	T_WALL	MAX_HEIGHT	T05
VW31	T_WALL	WALL_SURFACE_AREA	T07
5A03	T_WALL_INSP	BRKEY	STRUCTURE_REF_NUM
IW02	T_WALL_INSP	CORROSION_COND_RATE	
IW03	T_WALL_INSP	BACKFILL_COND_RATE	T13
IW04	T_WALL_INSP	WALL_COND_RATE	T14
IW05	T_WALL_INSP	PANEL_COND_RATE	
IW06	T_WALL_INSP	POST_COND_RATE	
IW07	T_WALL_INSP	DRAINAGE_COND_RATE	T15
IW08	T_WALL_INSP	FOUND_COND_RATE	T16
IW09	T_WALL_INSP	PARAPETS_COND_RATE	
IW10	T_WALL_INSP	STRRATING	T17
IW12	T_WALL_INSP	NEXT_WALL_INSPTYPE	
	T_WALL_INSP	INSPKEY	
1A09a	T_WORKFLOW	CREATEUSERKEY	
5A03	USERBRDG	BRKEY	STRUCTURE_REF_NUM
5E05	USERBRDG	CRGIS_SHPOKEY_NUM	
6A01	USERBRDG	SEN_DISTRICT	A02, R13
6A01	USERBRDG	SEN_DISTRICT2	A02, R13
6A02	USERBRDG	CONG_DISTRICT	A03, R14
6A02	USERBRDG	CONG_DISTRICT2	A03, R14
6A03	USERBRDG	LEG_DISTRICT	A04, R15
6A03	USERBRDG	LEG_DISTRICT2	A04, R15
6A04	USERBRDG	BOUNDARY_CODE	A10
6A05	USERBRDG	UTIL_PRESENT	C34
6A06	USERBRDG	SUB_AGENCY	A05
6A07	USERBRDG	FED_FUND	A12
6A09	USERBRDG	CRIT_FACILITY	A28
6A10	USERBRDG	FLOOD_INSP	E02-A
6A11	USERBRDG	COVERED_BRIDGE	C01-A
6A12	USERBRDG	DEM_REPLACED	
6A13	USERBRDG	DEM_REPLACED_DATE	
6A14	USERBRDG	HIST_DISTRICT_CONT	
6A15	USERBRDG	HIST_DISTRICT_NAME	
6A16	USERBRDG	PRESERV_CAND	
6A17	USERBRDG	FUTURE_BRIDGE_BILL	
6A18	USERBRDG	NETWORK	
6A19	USERBRDG	BUS_PLAN_NETWORK	B35
6A20	USERBRDG	WATERSHED	
6A21	USERBRDG	DEICING_EQUIP	
6A22	USERBRDG	CORRIDOR	
6A23	USERBRDG	OWNER_DESC	A20
6A24	USERBRDG	TURNBACK	
6A26	USERBRDG	DEPT_APPR_MATERIAL_TYPE	C05
6A26	USERBRDG	DEPT_MAIN_MATERIAL_TYPE	C05, S12, T08
6A27	USERBRDG	DEPT_APPR_PHYSICAL_TYPE	C05
6A27	USERBRDG	DEPT_MAIN_PHYSICAL_TYPE	C05, S12, T08
6A28	USERBRDG	DEPT_APPR_SPAN_INTERACTION	C05
6A28	USERBRDG	DEPT_MAIN_SPAN_INTERACTION	C05, S12, T08
6A29	USERBRDG	DEPT_APPR_STRUC_CONFIG	C05
6A29	USERBRDG	DEPT_MAIN_STRUC_CONFIG	C05, S12, T08
6A30	USERBRDG	APPR_DKSURFTYPE	C10
6A31	USERBRDG	APPR_DKMEMBTYPE	C10
6A32	USERBRDG	APPR_DKPROTECT	C10

**Appendix E
Crystal Reports Tables for BMS Items**

BMS2Code	Table Name	COLUMN NAME	BMS Code
6A33	USERBRDG	APPR_WS_THICKNESS	C10-A
6A33	USERBRDG	MAIN_WS_THICKNESS	C10-A
6A34	USERBRDG	APPR_WS_THICK_DATE	
6A34	USERBRDG	MAIN_WS_THICK_DATE	
6A35	USERBRDG	WS_THICKNESS_OVER	
6A35	USERBRDG	WS_THICKNESS_UNDER	
6A36	USERBRDG	PROTECT_YEAR	
6A37	USERBRDG	PROTECT_NOTE	
6A38	USERBRDG	DEPT_DKSTRUCTYP	C09
6A39	USERBRDG	RELIEF_JOINT	C19
6A40	USERBRDG	DECK_FORM_TYPE	C20
6A41	USERBRDG	DECK_JOINTS	C19-A
6A42	USERBRDG	DECK_REBAR_TYPE	C21
6A43	USERBRDG	APPR_PAVEMENT_WIDTH	A29
6A44	USERBRDG	APPR_FC_GROUP_NUM	C18, J06
6A44	USERBRDG	MAIN_FC_GROUP_NUM	C18, J02
6A45	USERBRDG	APPR_CRF_MEM_TYPE	C18-A, J07
6A45	USERBRDG	MAIN_CRF_MEM_TYPE	C18-A, J03
6A46	USERBRDG	APPR_CRF_FATIG_SUS	C18-A, J07
6A46	USERBRDG	MAIN_CRF_FATIG_SUS	C18-A, J03
6A47	USERBRDG	APPR_CRF_MATERIAL	C18-A, J07
6A47	USERBRDG	MAIN_CRF_MATERIAL	C18-A, J03
6A48	USERBRDG	APPR_CRF_CUM_ADTT	C18-A, J07
6A48	USERBRDG	MAIN_CRF_CUM_ADTT	C18-A, J03
6A49	USERBRDG	MAIN_CRF_CUM_ADTT	
6A49	USERBRDG	MAIN_CRF_FATIG_SUS	
6A49	USERBRDG	MAIN_CRF_MATERIAL	
6A49	USERBRDG	MAIN_CRF_MEM_TYPE	
6A50	USERBRDG	SUP_PROBLEM_TYPE	C25
6A51	USERBRDG	SUB_PROBLEM_TYPE	C43
6A52	USERBRDG	EST_TRUCK_TRAFFIC	C14
6A53	USERBRDG	EST_CUM_FATIG_LIFE	C02
6A54	USERBRDG	EST_TRUCK_TRAFFIC_MONTH	C15
6A54	USERBRDG	EST_TRUCK_TRAFFIC_YEAR	C15
6A55	USERBRDG	DECK_RECON_WORK_TYPE	F02
6A56	USERBRDG	SUP_RECON_WORK_TYPE	F02
6A57	USERBRDG	SUB_RECON_WORK_TYPE	F02
SS11	USERBRDG	APRAS_REF	PA01
SS12	USERBRDG	APRAS_MAX_AXLE_WEIGHT	PA03
SS13	USERBRDG	TOTAL_APRAS_SPAN_QTY	PA02
VD01	USERBRDG	DESIGN_METHOD	C04
VD02	USERBRDG	LIVE_LOAD_CONT	C35
VD03	USERBRDG	BEAM_GEOM	C11
VD04	USERBRDG	STEEL_BEAM_SPLICE_TYPE	C24
VD06	USERBRDG	VAC_PROC	C31
VD07	USERBRDG	STRAND_TYPE	C30
VD08	USERBRDG	BEAM_CONC_STRENGTH	C27
VD09	USERBRDG	BEAM_CONC_STRENGTH_INIT	C26
VD10	USERBRDG	SPLICE_FILLER	C36
VD10	USERBRDG	SPLICE_THRU	C36
VD10	USERBRDG	SPLICE_TYPE	C36
VD11	USERBRDG	TENSION_METHOD1	C29
VD11	USERBRDG	TENSION_METHOD2	C29
VD11	USERBRDG	TENSION_METHOD3	C29

**Appendix E
Crystal Reports Tables for BMS Items**

BMS2Code	Table Name	COLUMN NAME	BMS Code
VD14	USERBRDG	FAR_ABUT_TYPE	C37
VD14	USERBRDG	NEAR_ABUT_TYPE	C37
VD15	USERBRDG	FAR_ABUT_FOUND_TYPE	C38
VD15	USERBRDG	NEAR_ABUT_FOUND_TYPE	C38
VD28	USERBRDG	HAUNCH_TYPE	C32
VD29	USERBRDG	SPEC_PIER_CAP_TYPE	C41
VD31	USERBRDG	SEAT_CLEANING	
VD32	USERBRDG	SEAT_CLEANING_NOTE	
VD33	USERBRDG	SCUPPERS_WITH_DOWNSPOUTS	
VD34	USERBRDG	SCUPPERS_WITHOUT_DOWNSPOUTS	
VI01	USERBRDG	MIN_CRANE_REACH	
VI02	USERBRDG	HVPL	E05-A
VI03	USERBRDG	RR_FLAGGING	
VI04	USERBRDG	TRAF_FLAGGING	
VI05	USERBRDG	SIDEWALK_TYPE_LEFT	A34
VI06	USERBRDG	SIDEWALK_TYPE_RIGHT	A34
VI09	USERBRDG	HOR_CURVE	A36
VI10	USERBRDG	VERT_CURVE	A36
VI11	USERBRDG	INSP_LIMIT_NOTES	
VM01	USERBRDG	LEG_ACT_NUM	A21
VM02	USERBRDG	MAINT_RESP_DESC	A22
VN02	USERBRDG	SOIL_BORING_NOTES	
VN03	USERBRDG	MEM_PROP_TEST	
VN04	USERBRDG	STORAGE_LOC	
	USERBRDG	AGENCY_ID	
	USERBRDG	PARENT_BRKEY	
5A03	USERINSP	BRKEY	STRUCTURE_REF_NUM
6B01	USERINSP	SPEC_INSP_TYPE	E04
6B02	USERINSP	NEW_WS	
6B03	USERINSP	INV_CORRECT	
6B04	USERINSP	APPR_BUMP	
6B05	USERINSP	DECK_OVERLAY_MEAS_DATE	
6B06	USERINSP	UTILITY_REPAIR	
6B07	USERINSP	EST_SPALL_DELAM_PCT	
6B08	USERINSP	EST_SPALL_DELAM_DATE	
6B09	USERINSP	WEATHER_COND	
6B10	USERINSP	EST_CHLORIDE_CONTENT_PCT	
6B11	USERINSP	EST_CHLORIDE_CONTENT_DATE	
6B12	USERINSP	TEMP	
6B13	USERINSP	CONT_VERT	
6B14	USERINSP	DECKGEOM_TABLE	
6B15	USERINSP	DECKGEOM_DESIGN_EXCEPTION	
6B16	USERINSP	STRRATING_TABLE	
6B17	USERINSP	STRRATING_ADT	B27
6B18	USERINSP	STRRATING_IRLOAD	E30
6B19	USERINSP	CAP_APPR_CONTROL	
6B20	USERINSP	NEXT_INSP_TYPE	S02-A
6B21	USERINSP	NEXT_CRANE_INSP_DATE	
6B23	USERINSP	INSP_TEAM_HELPER	
6B24	USERINSP	CONSULTANT_HIRED_BY	E13
6B25	USERINSP	LOCAL_INSP_CONTRACT_NUM	
6B26	USERINSP	CREWHRS	E09
6B27	USERINSP	SNOOPERHRS	E10
6B28	USERINSP	FLAGGERHRS	

**Appendix E
Crystal Reports Tables for BMS Items**

BMS2Code	Table Name	COLUMN NAME	BMS Code
6B29	USERINSP	SPCREWHRS	
6B30	USERINSP	HELPERHRS	
6B31	USERINSP	SPEQUIPHRS	
6B32	USERINSP	FIELD_ENG_INSP_COST	E11
6B33	USERINSP	RIGGING_INSP_COST	E11
6B34	USERINSP	OFFICE_INSP_COST	E11
6B35	USERINSP	NEW_PAINT	
6B36	USERINSP	PAINT_COND_RATE	E19
6B37	USERINSP	PAINT_EXTENT_RATE	E19
6B38	USERINSP	APPR_SLAB_COND_RATE	E14
6B39	USERINSP	APPR_ROAD_COND_RATE	E15
6B40	USERINSP	DECK_WS_COND_RATE	E16
6B41	USERINSP	HBRR_ELIG	M06
6B42	USERINSP	SUFF_RATE_S1	M01
6B43	USERINSP	SUFF_RATE_S2	M02
6B44	USERINSP	SUFF_RATE_S3	M03
6B45	USERINSP	SUFF_RATE_S4	M04
6B46	USERINSP	MAINT_DEF_RATE	M34
6B47	USERINSP	DECK_CRACKING_METRIC	
6B48	USERINSP	MAT_STORE_UND	
6B49	USERINSP	INACCESS_PORTION_STRUCT	
7A09	USERINSP	INTERIM_INSP_FREQ	E01, W04
IR01b	USERINSP	LR_REVIEW_ACTION	
IR02	USERINSP	RATING_APPR_DATE	
IR02a	USERINSP	APPROVER_NAME	
IR03	USERINSP	RATING_DATE	
	USERINSP	INSPKEY	
	USERINSP	WATER_DEPTH	
	USERINSP	WATER_UNIT_QTY	
	USERINSP	WATER_VELOCITY	
IM20	USERPROJ	MPMS_PROJECT_NUM	
5A03	USERRWAY	BRKEY	STRUCTURE_REF_NUM
5C03, FR02	USERRWAY	ON_UNDER	B01
5C35	USERRWAY	RMS_ROADWAY_BPN	
6C01	USERRWAY	PA_COUNTY	PB08, R01
6C02	USERRWAY	SR_NUM	B02, PB08, R01
6C03	USERRWAY	SEG_NUM	B02, PB08, R01
6C04	USERRWAY	OFFSET	PB08, R01
6C05	USERRWAY	ADMIN_JURIS	B16
6C06	USERRWAY	FED_AID	R09
6C07	USERRWAY	GOVT_CONT	R08
6C08	USERRWAY	URBAN_RURAL	R11
6C09	USERRWAY	HIGHWAY_IND	R12
6C10	USERRWAY	HWY_SYS_TYPE	B17
6C11	USERRWAY	STATE_HWY_NETWORK	B19
6C12	USERRWAY	INTERSTATE_NETWORK	R12
6C14	USERRWAY	ATTN_NETWORK	R12
6C15	USERRWAY	NHS_NETWORK	R12
6C16	USERRWAY	TTN_NETWORK	R12
6C18, FR12	USERRWAY	TOT_HOR_CLEAR_LEFT	B21
6C19, FR13	USERRWAY	TOT_HOR_CLEAR_RIGHT	B21
6C20, FR10	USERRWAY	MIN_OVER_VERT_CLEAR_LEFT	B22, D08
6C21, FW11, FR11	USERRWAY	MIN_OVER_VERT_CLEAR_RIGHT	B22, D08
6C22, FR14	USERRWAY	DEF_VERT_CLEAR_LEFT	B23

**Appendix E
Crystal Reports Tables for BMS Items**

BMS2Code	Table Name	COLUMN NAME	BMS Code
6C23, FR15	USERRWAY	DEF_VERT_CLEAR_RIGHT	B23
6C25	USERRWAY	BRIDGEMED	B10
6C26	USERRWAY	MED_WIDTH	B10
6C27	USERRWAY	ADTT	B29, R06
6C28	USERRWAY	ADTT_YEAR	B30, R07
6C30	USERRWAY	ROADWAY_LABEL1	PR Screen
6C31	USERRWAY	ROADWAY_LABEL2	PR Screen
6C32	USERRWAY	ROADWAY_LABEL3	PR Screen
6C33	USERRWAY	ROADWAY_LABEL4	PR Screen
6C34	USERRWAY	FEATURE_TYPE	
6C35	USERRWAY	VERT_CLEAR_SIGN	B31
6C36	USERRWAY	VERT_CLEAR_SIGN_R	B31
6C37	USERRWAY	VRT_CLR_POST_LEFT_FT	
6C37	USERRWAY	VRT_CLR_POST_LEFT_INCH	
6C38	USERRWAY	VRT_CLR_POST_RIGHT_FT	
6C38	USERRWAY	VRT_CLR_POST_RIGHT_INCH	
FR01	USERRWAY	RR_NAME	B13
FR03	USERRWAY	RR_SERV_STATUS	B13
FR04	USERRWAY	RR_MILEPOST	B15
FR05	USERRWAY	AAR_DOT_NUM	B14
FR06	USERRWAY	ELEC_TRACK_QTY	B12
FR08	USERRWAY	SPAN_DESC	
FR09	USERRWAY	ADD_OPER_DESC	
FW02	USERRWAY	DEP_CLASS_1	
FW03	USERRWAY	DEP_CLASS_2	
FW04	USERRWAY	DEP_TIMEFRAME	
FW05	USERRWAY	DEP_CLASS_3	
FW06	USERRWAY	DEP_PERMIT_TYPE	
FW07	USERRWAY	STREAM_DRAIN_AREA	D07
FW08	USERRWAY	FISHABLE	D11
FW09	USERRWAY	WATERFLOW_DIR	
FW10	USERRWAY	PRIMARY_WATERWAY	
FW12	USERRWAY	MAX_WATER_SURF_ELEV	D10
FW13	USERRWAY	MAX_WATER_SURF_YEAR	D10
FW14	USERRWAY	DESIGN_FLOOD_MAGNITUDE	D09
FW15	USERRWAY	DESIGN_FLOOD_ELEV	D09
FW16	USERRWAY	DESIGN_FLOOD_FREQ	D09
FW17	USERRWAY	DESIGN_FLOOD_VEL	D09
FW18	USERRWAY	POLLUTANT_DESC	
FW19	USERRWAY	STREAM_RESTRICT_DESC	
5A03	USERSTRUNIT	BRKEY	STRUCTURE_REF_NUM
SP03	USERSTRUNIT	SPAN_LENGTH	C17
SP04	USERSTRUNIT	SPAN_DECK_WIDTH	
SP05	USERSTRUNIT	SPAN_FLARED	
SP07	USERSTRUNIT	DEPT_MATERIAL_TYPE	PA09
SP08	USERSTRUNIT	DEPT_PHYSICAL_TYPE	PA09
SP09	USERSTRUNIT	DEPT_SPAN_INTERACTION	PA09
SP10	USERSTRUNIT	DEPT_STRUC_CONFIG	PA09
	USERSTRUNIT	IDENTICAL_STRUNITKEY	
	USERSTRUNIT	STRUNITKEY	
5A24	V.BRIDGE	REPORTGROUP	

Appendix F

D-450's and D-491's

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5A01 SR ID: **5A03** BR Key: **7A01** Inspection Date:

1A09 Inspection Status:
7A02 Team Leader:
7A03 Inspection Type:
7A05 Inspected By:

Structure Description

5A08 FHWA Facility Carried:
5A07 Features Intersected:
5A09 Location:
5C01 Roadway Name:
5A06 City / Borough Name:
6B48 Combust. Mat. Under Bridge:
 Combust. Mat. Under Bridge Note:

Structure Type (Dept)

Main		Approach	
6A26 Material Makeup:		6A26 Material Makeup:	
6A27 Physical Makeup:		6A27 Physical Makeup:	
6A28 Span Interaction:		6A28 Span Interaction:	
6A29 Structural Config:		6A29 Structural Config:	

Sign Information

ID01	ID02	ID03	ID04	ID06	ID07	ID05	Comments
Type of Sign	Sign Needed	Sign Message	Near Adv	Bridge Site Near	Bridge Site Far	Far Adv	
0 - Bridge							
1 - Bridge Weight Limit							
2 - Except Combinations							
3 - One Truck at a Time							
4 - Vertical Clearance On							
5 - Vertical Clearance Under							
6 - One Lane Bridge							
7 - Narrow Bridge							
8 - Hazardous Clearance							
9 - Other							

5A01 SR ID: **5A03** BR Key: **7A01** Inspection Date

Features Intersected

6C02	5C03	5B09	5C06	5C29	4A20	4A19	6C18	6C19	6C20	6C21	6C22	6C23	6B17
SR ID	On/ Under	Skew Angle	Dir	NHS	Min Lat CI		Tot Hor CI		Min Vrt CI Rdwys		Vrt CI Over 10ft		ADT
SR	Seg				Left	Right	Left	Right	Left	Right	Left	Right	

Vertical Details

6C02	5C03	6C35	6C37	6C36	6C38	
SR ID	On/ Under	Left		Right		
SR	Seg	Vertical Clearance	Signing	Vertical Clear Posting	Vertical Clearance Signing	Vertical Clear Posting

- 6B15** Design Exceptions:
- 6A50** Sup Latent Problem:
- 6A51** Sub Latent Problem:

Deck Geometry

6B14 Table Used for Appraisal:

Controlling Values

- 5C10** ADT:
- 5C27** Bridge Road Width:
- 4A10** Appraisal:
Notes:
- 4A11** Underclr Appr:
- 6B13** Controlling Vertical:
Controlling Lateral:

5A01 SR ID:

5A03 BR Key:

7A01 Inspection Date:

Traffic Safety Features

Feature Type	IA01 Location	IA02 Adequacy Rating	IA03 Description	5C08 Posted Spd Lmt (mph)
1 - Railing				-1
Comment:				
2 - Transition				-1
Comment: Transition Comments				
3 - Approach Guiderail				-1
Comment: AG Comments				
4 - Approach railend				-1
Comment: APE Comments				

Approach Alignment

4A02 Code:
Comment:

Approach Roadway

6B39 Code:
Pavement:
Drainage:
Shoulders:

Approach Slab

6B38 Pavement:
6B04 Bump at Bridge:
6A39 Relief Joints: **6A41** Number of Joints:
 Comment:
6B02 New Wearing Surface Under Bridge:

5A01 SR ID: **5A03** BR Key: **7A01** Inspection Date:

Deck Wearing Surface

Main

5B02 Type of Wearing Surface:
5B03 Type of Memb. Water-Proof:
5B04 Deck Corrosion Protection:
6A33 Thickness:
6A34 Date Recorded:
6B40 Condition Rating:
IC02 Dk WS Notes:

Approach

6A30 Type of Wearing Surface:
6A31 Type of Memb. Water-Proof:
6A32 Deck Corrosion Protection:
6A33 Thickness:
6A34 Date Recorded:

Expansion Joints: **6A41** Number of Expansion Joints: 0

	VD25	VD26	VD27
Joint Number	Joint Type	Movement Class	Manufacture Code

Bridge Cleaning

VD31 Bridge Seat Cleaning: **VD32** Bridge Seat Cleaning Note:
VD33 Scuppers w/ Downspouts: **VD34** Scuppers w/o Downspouts:

Deck

1A01 Condition Rating:
6B07 Est. Spall Delamination: **6B08** Date:
6B10 Est. Chloride Content: **6B11** Date:
1A07 Unrepaired Spalls: **6B47** Deck Cracking Metric: 0.00 YD/SY
 Deck Top:
 Deck Underside:
 Deck Drainage:
 Expansion Joints:
 Deck Notes:

Superstructure

1A04 Condition Rating:
 Narrative:
 Girders/Beams:
 Floorbeams:
 Stringers:
 Diaphragms:
 Truss Members:
 Portals/Bracings:
 Bearings:
 Drainage System:

5A01

SR ID:

5A03

BR Key:

7A01

Inspection Date:

Substructure

1A02

Substructure Condition Rating:

Notes:

Near Abutment

Backwall:

Bridge Seats:

Cheekwalls:

Stem:

Wings:

Footing:

Piles:

IN20

Scour Undermine:

Settlement:

Embank Slope-wall:

Wall Drainage:

Far Abutment

Backwall:

Bridge Seats:

Cheekwalls:

Stem:

Wings:

Footing:

Piles:

IN20

Scour Undermine:

Settlement:

Embank Slope-wall:

Wall Drainage:

5A01

SR ID:

5A03

BR Key:

7A01

Inspection Date:

Navigational Control

4A21

Controls Exist:

4A22

Vert Clearance:

4A24

Lift Vertical:

4A23

Horz Clearance:

4A07

Pier Protection:

Pier Details

5D02

Pier/Bent Number:

IN20

Scour Undermine:

Condition Summary:

Bridge Seats:

Cheekwalls:

Columns/Stems:

Settlement:

5A01

SR ID:

5A03

BR Key:

7A01

Inspection Date:

Element Details

Structure Unit		5D02 Span: Span 1			5D04 Type: M - Main		
1B01 Element ID:	1B03 Environment:	1B05 Scale Factor Measurement:	1A10 Total QTY:	1A11 Cond State 1 QTY:	1A11 Cond State 2 QTY:	1A11 Cond State 3 QTY:	1A11 Cond State 4 QTY:

5A01 SR ID: **5A03** BR Key: **7A01** Inspection Date:

Main

6A44 Group:
6A45 - 6A48 Critical Ranking Factor:
6A49 Total Critical Ranking Factor:

Structure Type (Dept)

6A26 Material Makeup:
6A27 Physical Makeup:
6A28 Span Interaction:
6A29 Structural Config:

Approach

6A44 Group:
6A45 - 6A48 Critical Ranking Factor:
6A49 Total Critical Ranking Factor:

Structure Type (Dept)

6A26 Material Makeup:
6A27 Physical Makeup:
6A28 Span Interaction:
6A29 Structural Config:

Fracture Critical Details

IF01 Location: **IF02** Type: **IF05** FC Stress Category:
IF03 Member:

IF04 Member Detail:
IF06 Notes:

5A01 SR ID: **5A03** BR Key: **7A01** Inspection Date:

IU00a UW Reviewer Action:

IU00b Reviewer Comments:

IU02 Number of Units:

IU01 Recalculate SCBI:

IU03 SCBI Source:

4A08 SCBI:

IU04 Overall SCBI:

4A08b Scour Critical Category:

IU04b SCBI Recalculated:

IU06 Streambed Material #1:

IU06 Streambed Material #2:

IU07 Notes:

Current Countermeasures

CM Num	IU21 Type	IU22 Location	IU23 Condition	IU24 Subunit
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Possible Countermeasures

PCM Num	IU25 Location	IU26 Work Candidate
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SAR Calculation Data

IU08 Debris Potential:

IU09 Trapping Potential:

IU10 Pressure Flow:

IU11 NAB Location:

IU12 FAB Location:

US Left Wingwall

IU13 Presence:

IU14 Condition:

US Right Wingwall

IU15 Presence:

IU16 Condition:

Horizontal Debris Blockage

IU17 Start:

IU18 End:

Vertical Debris Blockage

IU19 Start:

IU20 End:

5A01 SR ID: **5A03** BR Key: **7A01** Inspection Date:

Sub Unit OSA Data

Observed Scour Rating Components

IN01	IN12	IN13	IN14	IN15	IN19	IN04	IN05	IN06	IN07	IN08	IN09	IN10	IN11	IN03
Sub Unit	Pier/ Abut Type	Inv. Found Type	Found Type	Strmbd Mat	Move Ind	Chg Since Last Insp	Scour Hole	Debris Potential	Scour-ability	Opening Adeq. / Channel	Sediment	Align-ment	Velocity/ Stream Slope	Observed Scour Rating

Other Subunit Details

IN01	IN16	IN18	IN17	IN20	IN21	IN02	IN22	IN23	IU27
Sub Unit	UW Insp Type	Water Dept	Observed Scour Depth	Scour Undermine	Counter-measures	Info from Current Insp	100 yr Flood Calc Scour Depth	500 yr Flood Calc Scour Depth	SCBI Code

IN24 Notes:

Underclearance

- IL09** Origin Description:
- IL10** Horizontal:
- IL11** Vertical:
- IL12** Notes: IL12 Notes

5A01 SR ID: **5A03** BR Key: **7A01** Inspection Date:

1A03 Culvert Condition Rating:
Notes:

VD19 Length of Culvert Barrel: FT

#	Opening Type	Length	Min Fill Height	Max Fill Height	Eff Width
---	--------------	--------	-----------------	-----------------	-----------

Top Slab:

Barrel:

Floor/Paving:

Headwall:

Wings:

Settlement:

Debris:

5A01

SR ID:

5A03

BR Key:

7A01

Inspection Date:

Channel

1A05

Channel/ Channel Protection Cond. Rating:

Channel:

Banks:

Streambed Movements:

Debris, Vegetation:

River Control Devices:

Embank/Strmbed Contr:

Drift Other:

Waterway Adequacy

1A06

Appraisal Code:

Notes:

IL02

Overtop Risk:

IL13

Worst Flood Event:

IL03

Traffic Delay:

IL14

Worst Flood Event Date:

5C22

Functional Class:

High Water Mark

IL05

Elevation:

IL06

Date:

IL07

New High Water Mark:

Notes:

5A01

SR ID:

5A03

BR Key:

7A01

Inspection Date:

Paint Condition

6B36

Paint Cond Rating:

6B37

Ext of Paint Cond:

6B35

New Paint:

Int Beam / Gird:

Fascias:

Splsh Zone Truss Gird:

Truss:

Bearings:

Other:

Load Ratings

IR01a

Load Rating Review Recommended: 1 - Review Rec.

Due To:

IR03

Calculation Date: March 20, 2018

IR02

Rating Approval Date: June 22, 2018

Load Rating Details

	IR10	IR11	IR11a	IR05	IR06	IR07	IR16	IR14	IR15	IR13	IR12
LOAD TYPE	IR LOAD	OR LOAD	SLC RATING	NBI IND	RTNG ANAL METH	CONT MEM TYPE	ANALYSIS ENGINEER	AASHTO MANUAL YEAR	AASHTO SPEC YEAR	OPR GOV CRITERIA	INV GOV CRITERIA

Notes Description:

Posting

VP01

Status Date:

VP02

Posting Status:

VP03

Special Restrictive Posting:

VP04

Posted Weight Limit:

VP05

Posted Limit Combination:

VP06

Posting Reason:

5A01

SR ID:

5A03

BR Key:

7A01

Inspection Date:

Proposed Maintenance Items :-

IM01	IM03	IM04		IM05	IM06	IM08	IM11
Type of Work	Action	Est Qty	UOM	Priority	Init Recm'd Date	Target Year	Work Assign

IM07

Status:

IM15

Notes:

IM09

Location:

Completed Maintenance Items :-

IM01	IM03	IM04		IM05	IM14a	IM08	IM11
Type of Work	Action	Est Qty	UOM	Priority	Completed Date	Target Year	Work Assign

IM07

Status:

IM15

Notes

IM09

Location:

5A01 SR ID: **5A03** BR Key: **7A01** Inspection Date:

1 - Approach Alignment

2 - Approach Roadway - Pavement

3 - Approach Roadway - Drainage

4 - Approach Roadway - Shoulders

5 - Approach Slab

8 - Transition

9 - Approach Guiderail

10 - Approach Rail End

11 - Deck Geometry

12 - Deck

13 - Deck Drainage

14 - Deck Wearing Surface

15 - Superstructure

5A01 SR ID: **5A03** BR Key: **7A01** Inspection Date:

Current Inspection

7A03 Primary Type:
7A06 Types of Inspections Performed:
 NBI Underwater Element Fracture Critical Other Special

Inspection Man Hours

6B26 NBI Crew: **6B30** Underwater:
6B28 Fracture Critical: **6B29** Other 1:
6B27 Crane: **6B31** Other 2:

Inspection Costs (Entered to nearest dollar)

6B32 Engineering: **6B33** Rigging:
6B34 Office:

Special Equip Used:

6B12 Temperature: **6B09** Weather:
6B03 Inventory Review Recommended:

Change Notes:

Inspection Team

7A05 Inspected By:
7A02 Team Leader:
6B23 Team Member:
6B24 Hired By:
6B25 Insp Contract Num:
2A02 Inspection Notes:
6B49 Inaccessible Portion
 of Structure:
IC01 Inaccessible
 Inspection Location:

5A01 SR ID: **5A03** BR Key: **7A01** Inspection Date:

Next Inspection

7A14 Next Inspection By:

6B20 Next Insp Type:

Schedule

Insp Types	7A07 Required	7A09 Frequency	7A10 Next Date
NBI:	----		
Fractical Critical:			
Underwater:			
Other Special:			
Element:			
Crane:	----		6B21

6B01 Special InspType:

Estimated Inspection Man Hours

7A12	NBI Crew:	7A17	Underwater:
7A15	Fracture Critical:	7A16	Other 1:
7A13	Crane:	7A18	Other 2:

5A01

SR ID:

5A03

BR Key:

7A01

Inspection Date:

Inspection Information

6A26 - 6A29

Structure Type:

7A03

Primary Insp Type:

IS01

Sign Insp Type:

Condition Ratings

IS02

Foundation:

Notes:

IS03

Guide Rail:

Notes:

IS04

Column:

Notes:

IS05

Method of Access:

Notes:

IS06

Sign:

Notes:

IS07

Lights:

Notes:

IS08

Surface/Paint:

Notes:

IS09

Horz Memb/Frame:

Notes:

IS10

Overall:

Notes:

Inspection Notes:

IS15

Sign Asset Tags - Exist/Cond:

Notes:

5A01

SR ID:

5A03

BR Key:

7A01

Inspection Date:

Inventory Items

Structure Type and Material Items

- S.1 Number of Bores:
- S.2 Tunnel Shape:
- S.3 Portal Shape:
- S.4 Ground Conditions:
- S.5 Complex:

Age and Service Items

- A.8 Service in Tunnel:

Classification Items

- C.3 Direction of Traffic:
- C.4 Toll:
- C.7 Functional Classification:
- C.8 Urban Code:

5A01 SR ID: **5A03** BR Key: **7A01** Inspection Date:

Inspection Information

6A26 - 6A29 Structure Type:
IW01 Primary Insp Type:
VW06 Backfill Type 1: **VW07** Backfill Type 2:

Condition Ratings

IW02 Anchorage:
Notes:
IW07 Drainage:
Notes:
IW03 Backfill/Damping:
Notes:
IW08 Foundation:
Notes:
IW04 Wall:
Notes:
IW09 Parapets:
Notes:
IW05 Panel:
Notes:
IW06 Post:
Notes:
IW10 Overall:
Notes:

Next Inspection Information

IW12 Next Inspection Type:
IW13 Next Inspection Freq:
IW14 Next Inspection Date:

Inspection Notes:

Defects

Defect	Long Description	Defect Location
--------	------------------	-----------------

Structure Identification

*5A01	Structure ID:	5A03	NBI Structure No.:
5A02	Name:		Agency ID::
			*7A01 Inspection Date:

Location		Age and Service	
5A04	District:	*5A15	Year Built:
5A05	County:	*5A16	Year Reconstruct:
*5A06	City/Town/Place:	*5A17	Type Service On:
*5A07	Feature Intersected:	*5A18	Under:
*5A08	Facility Carried:	*5A19	# Lanes Under:
*5A09	Location:	Management	
*5A10	Lat / *5A11 Long:	5A20	Maint Resp:
*5A12	Border State/FHWA Reg:	*5A21	Owner:
	Share: %	5A23	Agency Admin Area:
*5A13	Border Struc No:		
*5A14	FIPS State:		
*5A14	FIPS Region:		

Deck Information		Span Information	
*5B02	Deck Surface Type:	*5B11	Number of Main Spans:
*5B03	Deck Membrane Type:	*5B12	Main Span Material:
*5B04	Deck Protection:	*5B13	Main Span Design:
	*5B05 Left: ft.	*5B14	Number of Approach Spans:
	Curb Sidewalk Width:	*5B15	Approach Span Material:
	*5B06 Right: ft.	*5B16	Approach Span Design:
*5B07	Deck Width: ft.	*5B17	Maximum Span Length: ft.
*5B09	Skew: degrees	*5B18	Structure Length: ft.
*5B10	Structure Flared:	5B19	Deck Area: sf.
		5B20	Total Length: ft.

Classification Information	
5E01	NBIS Bridge Len:
5E02	Parallel Structure:
5E03	Temporary Structure:
*5E04	Hist Significance:
5E05	Frac Crit Details:

Agency Items	
5E10	ACM Status:
5E11	IR:
5E12	IC:
5E13	ACM Insp Date:
5E14	ACM Qty:
5E15	ACM num Loc:
5E16	ACM Loc Desc 1:
5E17	ACM Loc Desc 2:
5E18	9:
5E19	10:
5E20	11:
5E21	12:
5E22	13:
5E23	14:
5E24	15:

Structure Identification

*5A01 Structure ID: 5A03 NBI Structure No.:
5A02 Name: Agency ID::
*7A01 Inspection Date:

2A01 Structure Notes

Structure Identification

*5A01 Structure ID: 5A03 NBI Structure No.:
5A02 Name: Agency ID: *7A01 Inspection Date:

Condition

*1A04 Deck: *1A02 Substructure: *1A03 Culvert:
1A07 Superstructure: *1A05 Channel: *1A06 Waterway:
Unrep Spalls(sf): 1A09 Inspection Status:

Structure Appraisal

NBI Appraisal Rating

*4A02 Approach Alignment:	*4A09 Structural Eval:
*4A03 Railing:	*4A10 Deck Geometry:
*4A04 Transition:	*4A11 Underclearances:
*4A05 Approach Guiderail:	4A12 SD/FO Status:
*4A06 Approach Rail End:	4A13 Sufficiency Rating:
*4A07 Pier Protection:	
*4A08 Scour Critical:	
*4B03 Posting:	

Schedule Summary

7A06 Inspection Performed

7A02 Inspection Date :	National Bridge Inventory:
*7A03 Team Leader:	Element:
7A04 Primary Type:	Fracture Critical:
7A05 Review Required:	Underwater:
Inspected By:	Other Special:

Schedule

7A07 Required (Y/N)	7A08 Last Date	*7A09 Frequency	*7A10 Next Date
NBI:			
Fracture Critical:			
Underwater			
Other Special:			
Element:			

Bridge Inspection Resources

7A14 Next Team Lead:	7A12 NBI Crew Hours	7A13 Crane Hours:
Next insp By:	7A15 Frac Crit Hours:	7A16 Other 1 Hours:
	7A17 Underwater Hours:	7A18 Other 2 Hours:

Structure Identification

*5A01 Structure ID: 5A03 NBI Structure No.:
5A02 Name: Agency ID: *7A01 Inspection Date:

General Structure Type

General		Structure Type	
6A01	Senat Dist:	Main	Approach
6A02	Cong Dist:	*6A26	Material:
6A03	Leg Dist:	*6A27	Physical:
6A04	Bndy:	*6A28	Span Interaction:
6A05	Util Present:	*6A29	Struct Confiq:
*6A06	Sub Agency:	Deck Wearing Surface Info	
6A07	Fed Fund:	Main	Approach
*6A08	Dept Struc Len: ft.	*5B02 / 6A30	Surf:
6A09	Critical Facility:	*5B03 / 6A31	Memb:
6A10	Flood Insp:	5B04 / 6A32	Protect:
6A11	Covered Bridge:	6A33	Thickness (in):
6A12	Dem/Repl Ind:	6A34	Dt Recorded:
6A13	Dem/Repl Date:	6A35	Surf Thick (Over/Under): in. in.
6A14	Hist Dist Cont:	6A36	Protect Year:
6A15	Hist Dist:	6A37	Protect Note:
6A16	Preserv Candidate:		
6A17	Future Bridge Bill:		
6A18	Network:		
6A19	Bus Plan Ntk:		
6A20	Watershed:		
6A21	De-Ice Equip:		
6A22	Corridor:		
6A23	Owner Desc:		
6A24	Turnback Desc:		

Latent Problem Deck Info

6A50	Sup Struc:	6A38	Dept Structyp:
6A51	Sub Struc:	6A39	Relief Joints:
		6A40	Form Type:
		6A41	No. of Joints:
		6A42	Rebar Type:
		6A43	Appr Pav Width (ft): ft.

Est Truck Traffic Fracture Critical

Est Truck Traffic		Fracture Critical	
6A52	Traffic:		Approach
6A53	Fatig Life:	6A44	Group No.:
6A54	Year:	6A45	Mem Type:
		6A46	Fatig Sus:
		6A47	Material:
		6A48	ADTT
		6A49	Total Crf:

Structure Identification

*5A01 Structure ID: 5A03 NBI Structure No.:
 5A02 Name: Agency ID: *7A01 Inspection Date:

General

*6B01 Spc Insp Type: 6B02 New Wear Srf Ind:
 6B03 Inventory Correction Ind: 6B04 Bump at Bridge Ind:
 6B05 Deck Overlay Meas Dt: 6B06 Utility Repair ind:
 6B07 Est Spall Delam %: 6B08 Est Spall Delam Dt:
 6B09 Weather:
 6B10 Est Spall Chloride %: 6B11 Est Spall Chloride Dt:
 6B12 Temperature: 6B13 Under Cont Vert:
 6B14 Deck Geom Appr Tbl: 6B15 Design Except:
 Inspection Status:

Structure Condition / Load Appraisal

6B16 Appr Based On: 6B17 ADT: 6B18 Inventory Rating:
 6B19 Cap Appr Cntrl:

Next Inspection

Inspection Team

6B20 Insp Type: 7A02 Team Leader: 7A05 Inspected By:
 6B21 Crane Insp Dt: 6B23 Member:
 6B24 Hired By: 6B25 Insp Contract Num:

Inspection Hrs (Actual)

Inspection Cost

6B26 NBI Crew: 6B27 Crane: 6B32 Engineer:
 6B28 Frac Crit: 6B29 Other 1: 6B33 Rigging:
 6B30 Uwater: 6B31 Other 2: 6B34 Office:

Paint Info

Condition Rating

6B35 New Paint Since Last Insp: 6B38 Appr Slab:
 6B36 Paint: 6B39 Appr Roadway:
 6B37 Paint (Extent): 6B40 Deck Wear Surf:

Structure Identification

*5A01 Structure ID: 5A03 NBI Structure No.:
5A02 Name: Agency ID:
*7A01 Inspection Date:

Roadway Detail

Roadway Identification

Traffic

*5C01 Route Name: *5C08 Lanes: Medians: Speed: mph
*5C03 On/Under: 5C09 ADT Class:
*5C04 Kind HWY(Rt Pref): *5C10 Recent ADT: *5C11 Year:
*5C05 Desig. Lvl Service: 5C12 Future ADT: 5C13 Year:
*5C06 Rte # / Suffix: *5C14 Truck % ADT:
5C07 Critical Facility: *5C15 Detour Length: mi. 5C16 Speed: mph
6C27 ADTT: 6C28 ADTT Year:

Highway Networks and Service Classifications

Width

5C18 Mile Pt.: mi. *5C26 Appr. Road: ft. *5C27 Roadway: ft.
5C19 Nat Base Net: **Alternate Classifications**
5C20 LRS Inventory Rte: Sub#: *5C28 Defense Hwy:
*5C21 Toll Facility: *5C29 Nat. Hwy Sys.: 5C30 SB:
*5C22 Functional Class: 5C31 Fed Lands Hwy: 5C32 Trans:
5C23 Traffic Direction: *5C33 Nat. Truck Net: 5C34 Emer:

State Roadway Location

Roadway Admin

6C01 County: *6C05 Admin Juris:
6C02 SR Num: 6C07 Gov Cont:
6C03 Seg: 6C06 Fed Aid:
6C04 Offset: 6C08 Urban / Rural:
6C09 Hwy ind:
6C10 Hwy System Typ:

Clearances

*4A20 Min Lat Under (L): ft. *4A19 Min Lat Under (R): ft.
*6C18 Horiz (L): ft. *6C19 Horiz (R): ft.
*6C20 Min Vert (L): ft. *6C21 Min Vert (R): ft.
*6C22 Def Vert (L): ft. *6C23 Def Vert (R): ft.
6C24 Vert Clear Sign:

Median

*6C25 Type: *6C26 Width: ft.

Network

6C11 State Code: 6C12 INT:
6C13 CCVNET: 6C14 ATTT:
6C15 RMS NHS: 6C16 TTTN:

Roadway Labels

6C30 Gen Seg Ahead Lbl:
6C31 User Seg Ahead Lbl:
6C32 Gen Seg Back Lbl:
6C33 User Seg Back Lbl:

Notes:

Structure Identification

*5A01 Structure ID:

5A03 NBI Structure No.:

5A02 Name:

Agency ID:

*7A01 Inspection Date:

Waterway Detail

*5C03 On/Under

*4A21 Nav Control Exists:

*4A22 Nav Vertical Clr: ft.

*4A23 Nav Horizontal Clr:

*4A24 Min Vert Lft Clr: ft.

Waterway

*FW01 Stream Name:

FW03 Stream Classification 1:

FW03 Stream Classification 2

FW04 Timeframe:

FW03 Stream Classification 3

FW06 Permit Type:

FW07 Drainage Area: sq. mi.

FW08 Fishable:

FW09 Waterflow Direction:

FW10 Primary Waterway:

FW11 Vertical Clearance: ft.

FW12 Max W.S. Elevation: ft.

FW13 Max W.S. Elevation Year:

Design Flood Data

FW14 Magnitude: cf/s

FW15 Elevation: ft.

FW16 Frequency: yrs

FW17 Velocity: fps.

FW18 Pollutant Description:

Structure Identification

*5A01 Structure ID: 5A03 NBI Structure No.:
5A02 Name: Agency ID:
*7A01 Inspection Date:

Railroad Detail

FR01 RR Name: *FR02 On/Under:
FR03 Service Status: *FR04 RR Milepost:
FR05 AAR DOT Num:
FR06 Num of Electrified Tracks: FR07 Total Num of Tracks:
FR08 Span Desc:
FR09 Additional Operator:

Clearance

*4A20 Min Lat Under (L): ft. *4A19 Min Lat Under (R): ft.
*FR10 Min Over Vert (L): ft. *FR11 Min Over Vert (R): ft.
*FR12 Horiz (L): ft. *FR13 Horiz (R): ft.
*FR14 Def Vert (L): ft. *FR15 Def Vert (R): ft.
FR16 Notes:

Structure Identification

*5A01 Structure ID: 5A03 NBI Structure No.:
5A02 Name: Agency ID:

Utility Detail

FT01 Utility Name: FT02 Utility Type:
FT03 License Number: FT04 License Issue Date
FT05 Utility Weight:
FT06 Utility Address:
FT08 Location: FT07 Hazmat:
FT09 Contact Info:
FT10 Notes:

Structure Identification

*5A01 Structure ID: 5A03 NBI Structure No.:
5A02 Name: Agency ID:
*7A01 Inspection Date:

Number of Spans

5B11 Number of Main Spans: 2 5B14 Number of Approach Spans: 0

5D01 Unit Key	5D04 Type	5D02 Unit ID	SP03 Span Length
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Structure Identification

*5A01 Structure ID: 5A03 NBI Structure No.:
5A02 Name: Agency ID:
*7A01 Inspection Date:

VD01 Design Method: VD02 Live Load Continuity:
VD03 Geometry:

Superstructure Steel

VD04 Steel Beam Splice: VD05 Steel Types:

Superstructure Concrete

VD06 Vacuum Process: VD11 Design Tension Methods :

VD07 Strand Type:

VD08 Comp Strength @ 28 Days:-1 psi.

VD09 Comp Strength @ Release-1 psi.

VD10 Prestressed Splice Type: Design:
Filler:
Through:

VD12 Void Types: VD13 Strand Sizes:

Substructure

VD14 Abutment Type: VD17 Pier Foundation Types:

Near:

Far:

VD15 Abutment Foundation Type:

Near:

Far:

Pier Types

VD16 Material Type: VD16 Configuration Type:

Culvert

Expansion Joint

Other

VD28 Haunch Type: VD30 Bearing Types:

VD29 Special Pier Cap:

Structure Identification

*5A01 Structure ID: 5A03 NBI Structure No.:
5A02 Name: Agency ID:
*7A01 Inspection Date:

VN01 Design Exception Codes: **VN02** test
Soil Boring Notes:

VN03 Test Description: **VN04** Storage Location:

VN05-VN07 Drawings

Drawing Type	Drawing Number	Description
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Structure Identification

*5A01	Structure ID:	5A03	NBI Structure No.:
5A02	Name: Test		Agency ID:
			*7A01 Inspection Date:

Miscellaneous

VI01	Min Crane Reach:	VI02	High Voltage Power Line Ind:
VI03	RR Flagger Required:	VI04	Traffic Flagger Required:

Sidewalk

VI05	Type (Left):	VI06	Type (Right):
VI07	Width (Left):	VI08	Width (Right):
	ft.		ft.
VI09	Horizontal Curve:	VI10	Vertical Curve:

VI11 Inspection Limitations

Equipment

Permits

Structure Identification

*5A01 Structure ID: 5A03 NBI Structure No.:
5A02 Name: Agency ID: *7A01 Inspection Date:

Posting Detail

VP01 Status Date: VP06 Posting Reason:
*VP02 Posting Status: VP07 Field Conditions:
VP03 Special Restrictive Posting VP08 Special Conditions:
VP04 Posted Weight Limit: VP09 AASHTO Impact Code:
VP05 Posted Limit Combination:

Structure Identification

*5A01 Structure ID: 5A03 NBI Structure No.:
 5A02 Name: Agency ID:
*7A01 INspection Date:

Structure Unit		Structure Unit ID: 1			Type: M - Main			
Elem / Env	1B01 Element Description	1A10 Qty	UOM	A11 Qty1	A11 Qty2	A11 Qty3	A11 Qty4	

Structure Identification

*5A01 Structure ID:

5A03 NBI Structure No.:

5A02 Name:

Agency ID:

*7A01 Inspection Date:

Inspection Comments

IC01 Comment Type IC02 Comment

Structure Identification

*5A01 Structure ID:

5A03 NBI Structure No.:

5A02 Name:

Agency ID:

*7A01 Inspection Date:

Substructure Comments

IC03 Substruc Unit IC04 Comment Type

Structure Identification

5A01 Structure ID:
5A02 Name:

5A03 NBI Structure No.:
Agency ID:
***7A01** Inspection Date:

Inspection - Load Ratings Detail

***IR01a** Load Rating Review Recommended:
***IR03** Calc Date:

***IR01b** Reviewer Action:
***IR02** Rating Approved:

***IR04** Load
Type

***IR05** NBI

***IR06** Load

***IR10** Inv
Rating

***IR11** Op
Rating

***IR12** Govern
Critical Inventory

***IR13** Govern
Critical

Structure Identification

5A01 Structure ID: **5A03** NBI Structure No.:
5A02 Name: **Agency ID:**
***7A01 Inspection Date:**

Inspection Information

7A03 Primary Insp Type: 7A09 Frequency: **Inspection Status:**

Main

6A44 Group: 6A45-6A48 CRF: 6A49 Total CRF: 6A26-6A29 Dept. Struc Type:

Approach

6A44 Group: 6A45-6A48 CRF: 6A49 Total CRF: 6A26-6A29 Dept. Struc Type:

Fracture Critical Members

IF01 FC Location	IF02 Member Type	IF03 FC Member	IF04 Member Detail	IF05 Fatigue Stress Cat
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Structure Identification

*5A01 Structure ID: 5A03 NBI Structure No.:
5A02 Name: Agency ID: *7A01 Inspection Date:

Inspection - Underwater

IU01 Recalculate SCBI: IU02 Num Units: 1A09 Inspection Status
7A03 Primary Insp Type IU03 SCBI Source: *4A08 SCBI:
7A09 Inspection Freq:
IU00a UW Reviewer Action: IU00b Review Comments:

SCBI

IU04 Overall SCBI:
IU05 Total SAR:
IU06 Stream Bed Material:
IU07 Stream Bed Material Desc

SAR Calculation Data

IU08 Debris Potential: IU15 US Right WW Presence:
IU09 Trapping Potential: IU16 Condition:
IU10 Pressure Flow: IU17 Horiz Debris Start:
IU11 NAB Loc: IU18 Horiz Debris End:
IU12 FAB Location: IU19 Vert Debris Start:
IU13 US Left WW Presence IU20 Vert Debris End:
IU14 Condition:

Current Countermeasures

Potential Countermeasures

Structure Identification

*5A01 Structure ID:
 5A02 Name:

5A03 NBI Structure No.:
 Agency ID:

*7A01 Inspection Date:

IN01 - IN11 Sub Unit Detail

IN01	IN02	IN03	IN04	IN05	IN06	IN07	IN08	IN09	IN10	IN11
Sub Unit	Curr Ind	Scour Rating	Change Since Last Insp	Scour Hole	Debris Potn	Scourability	Opening Adeq Channel	Sediment	Alignmen t	Velocity Stream Slope

Structure Identification

*5A01 Structure ID:
5A02 Name:

5A03 NBI Structure No.:
Agency ID:
*7A01 Inspection Date:

IN01 - IN11 Sub Unit Detail

IN01	IN12	IN13	IN14	IN15	IN16	IN17	IN18
Sub	Pier/	Inv Found	Found	Streambed	UW	Observed	Water
Unit	Abut	Type	Type	Matl	Inspection	Scour	Depth
	Type				Type	Depth	

Structure Identification

*5A01 Structure ID:
5A02 Name:

5A03 NBI Structure No.:
Agency ID:

*7A01 Inspection Date:

IN01 - IN11 Sub Unit Detail

IN19 Movement Indicator	IN20 Scour/ Undermin e Indicator	IN21 Countermeasure s	IN22 Calculated Scour Depth w/ 100 Year Flood	IN23 Calculated Scour Depth w/ 500 Year Flood	IN24 Inspection Notes
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Structure Identification

5A01 Structure ID:

5A03 NBI Structure No.:

5A02 Name:

Agency ID:

*7A01 Inspection Date:

Inspection Information

7A03 Primary Insp Type:

7A09 Frequency:

Inspection Status:

Proposed Maintenance Detail

IM01 Scope:

IM08 Target Year:

IM02 Element:

IM09 Location:

IM03 Action:

IM10 Estimated Cost:

IM04 Est. Quantity:

IM11 Work Assignment:

IM05 Priority:

IM12 Drawing Indicator:

IM06 Date Recom:

IM13 Permit Indicator:

IM07 Status:

IM15a Notes:

Structure Identification

5A01 Structure ID:

5A03 NBI Structure No.:

5A02 Name:

Agency ID:

*7A01 Inspection Date:

Inspection Information

7A03 Primary Insp Type:

7A09 Frequency:

Inspection Status:

Completed Maintenance Detail

IM01 Scope:

IM14 Comp Date:

IM02 Element:

IM16 SAP Closed Date:

IM03 Action:

IM17 SAP WO Number:

IM05 Priority:

IM18 Actual Quantity:

IM07 Status:

IM19 Actual Cost:

IM20 MPMS Number:

IM21 Notes:

Structure Identification

*5A01 Structure ID: 5A03 NBI Structure No.:
5A02 Name: Agency ID:
*7A01 Inspection Date:

Identification Items

Structure Type And Material Items

I.15 Border Tunnel State Code : S.1 Number of Bores :
I.16 Border Tunnel Financial Responsibility : S.2 Tunnel Shape :
I.17 Border Tunnel Number : S.3 Portal Shape :
I.18 Border Tunnel Inspection Responsibility : S.4 Ground Conditions :
S.5 Complex :

Navigation

Age and Service Items

N.1 Under Navigable Waterway : A.5 Annual Average Daily Truck Traffic :
N.2 Navigable Waterway Clearance : A.8 Service in Tunnel :
N.3 Tunnel or Portal Island Protection
from Navigation :

Substructure

N.1 Direction of Traffic :
N.1 Toll :
N.1 Functional Classification :
N.1 Urban Code :

Appendix G

Stone Masonry Arch Condition Rating Guidelines

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Appendix G – Stone Masonry Arch Condition Rating Guidelines

Stone Masonry Arch Condition Rating Guidelines

The following condition codes are to be used in conjunction with Table 1.0 when performing a field inspection of a stone masonry arch bridge. The inspector will frequently need to use sound judgment when deciding which condition rating is to be used for various items. When deciding which code to use, the description of condition codes in Section 1A Inspection Condition of Publication 100A should also be considered.

Tables 2.0 & 3.0 are field aids for the bridge inspectors. They summarize, in tabular form, the information given in the CONDITION RATING GUIDELINES.

A. INTRADOS

1. Changes since Last Inspection

Changes to the intrados since the previous inspection could indicate a serious problem and need to be closely examined. Widening or lengthening of cracks, appearance of bulge or increased bulging over a substantial area which identifies a change in the geometry of the original arch curvature, additional missing stones, all must be well documented to show extent and location of changes.

Rating:

6,7,8,9	No changes noted.
5	Minor extension of cracks, additional small missing stones
4	Visible moderate widening of crack. A few additional isolated missing stones
3	New distortion of original arch curvature or significant transverse or longitudinal crack.
2	Substantial widening of cracks, increased distortion of arch shape or significant losses of stones in intrados. Bridge closure may be required.
1	Bridge is Closed. Movement or loss of stones has advanced to a point where failure appears imminent
0	Arch barrel has failed

Appendix G – Stone Masonry Arch Condition Rating Guidelines

2. Bulge

Visible bulging which changes the geometry of the arch shape over a substantial area of the intrados could indicate a serious condition and possibly the formation of a hinge that could ultimately be part of a hinged collapse mechanism. This condition must be well documented with a sketch of the reflected view and with descriptions on extent, location and magnitude of bulge.

Rating:

- 5,6,7,8,9 No bulge or geometric distortion
- 4 Slight bulging or geometric distortion visible
- 3 Visible bulge or geometric distortion with associated crack
- 2 Bulge or geometric distortion and crack has extended to a point where collapse of arch is possible
- 1 Bridge is Closed. Bulge or geometric distortion has advanced to a point where failure appears imminent.
- 0 Arch barrel has failed

Appendix G – Stone Masonry Arch Condition Rating Guidelines

3. Transverse Cracks

Visible, continuous transverse cracking in the intrados could be due to deformation of the arch intrados that occurs during the formation of a “hinge” in the stone masonry. Hinge formation is a precursor to the formation of a hinged collapse mechanism. Any visible bulging of the intrados that is associated with a transverse crack would indicate a more advanced condition in hinge formation. These cracks must be documented with a sketch showing location and measurements of length and width. Reference markers should be installed at crack location to assure accurate monitoring of any crack growth.

Rating:

- | | |
|-------|---|
| 7,8,9 | No transverse cracks |
| 6 | Any transverse crack with length less than the width of one stone |
| 5 | Short, isolated transverse crack |
| 4 | Transverse crack for substantial length of intrados |
| 3 | Transverse crack is accompanied by visible slight bulging of intrados |
| 2 | Transverse crack associated with significant bulging of intrados. |
| 1 | Bridge is Closed. Movement has advanced to a point where failure appears imminent |
| 0 | Arch barrel has failed |

Appendix G – Stone Masonry Arch Condition Rating Guidelines

4. Longitudinal and Skewed Cracks

Cracks are differentiated by location and orientation. Longitudinal cracks adjacent to the ringstone are rated in the outboard row of Table 1.0, remainder of cracks are considered interior cracks. Outboard cracks are defined as cracks that are located within a distance of $0.1 \times$ (Bridge Width) from the interior side of the ringstone with a maximum distance of 5'. Identifying these longitudinal cracks separately is desirable because the outboard cracks may provide information on movement of the spandrel walls. Skewed cracks extend diagonally across the intrados and could indicate a condition different from those causing longitudinal cracks, such as foundation settlement. When cracks are rated as 4 or less, the inspection report should include a sketch of the reflected view of the intrados indicating the location, extent and width of cracks. Closely spaced parallel longitudinal cracks could indicate the barrel is breaking up and segments are working independently. For wide cracks, install marker reference points on both sides of the crack and record the distance between the markers. Provide a sketch showing the marker locations and give a description of the marker type.

Rating:

- 8 or 9 Original intrados rehabilitated and in good condition
- 6 or 7 No cracks or fine cracks
- 5 Only medium width cracks visible
- 4 Wide cracks up to a maximum of $\frac{1}{2}$ " at interior locations and up to 1" along outboard edge. There is no indication that a significant number of stones are being dislodged or in any way moving as a result of the cracks.
- 3 Wide cracks or gaps appearing which have resulted in loosening or movement of adjacent stones.
- 2 Gap along ringstone is coincident with visible movement of spandrel wall. Closely spaced parallel cracks or interior cracks have resulted in loosening or loss of a significant number of stones.
- 1 Bridge is closed. Imminent failure of spandrel wall or arch barrel or serious loss of stones associated with cracking.
- 0 Arch barrel has failed

Appendix G – Stone Masonry Arch Condition Rating Guidelines

5. Missing Stones

Isolated missing stones in the intrados are usually not a significant concern; however a substantial opening created by loss of stones reduces the confinement of adjacent stones and could result in an accelerated loss of intrados stone masonry. When this item is rated 4 or less, a sketch of a reflected view should be made which shows location and dimensions of areas with missing stones.

Rating:

- 8 or 9 Intrados not visible due to shotcrete or other material in good condition
- 6 or 7 None missing or a few small missing stones. Cracks with efflorescence in shotcrete or concrete veneer.
- 5 A few random missing stones
- 4 Moderate opening in intrados due to missing stones. There are no associated bulges. Small area of fill may be visible.
- 3 Structural capacity of arch barrel could be affected by loss of stones. As a result of openings in intrados loss of additional stones appears imminent. A significant area of fill material may be visible.
- 2 The loss of stones may have significantly reduced capacity or reduced stone confinement to such an extent that there may be a sudden large loss of intrados stones. Opening has increased and is steadily increasing. There may be a loss of fill material
- 1 Bridge is Closed. Imminent failure of arch barrel.
- 0 Arch barrel has failed

Appendix G – Stone Masonry Arch Condition Rating Guidelines

6. Missing Mortar

Minor superficial mortar loss is relatively shallow, does not indicate the onset of stones loosening and is easily repaired by repointing. A significant loss of mortar will result in the loosening of stones and eventually stones being dislodged from the intrados.

Rating:

- | | |
|--------|---|
| 8 or 9 | Mortar joints have been repointed |
| 6 or 7 | None or minor mortar loss |
| 5 | Substantial area of mortar loss of moderate depth |
| 4 | Deep loss over significant area which may have resulted in or contributed to the loss of intrados stones |
| 3 | Mortar material is missing to such an extent that a significant number of stones may be loosening or have already been dislodged from intrados. |
| 2 | Opening has increased and is steadily increasing. There may be a loss of fill material |
| 1 | Bridge is closed. Imminent failure of intrados |
| 0 | Arch barrel has failed |

Appendix G – Stone Masonry Arch Condition Rating Guidelines

7. Seepage

Poor drainage may result in water seepage through intrados stonework. Especially when combined with freeze - thaw conditions this can result in stone and mortar deterioration along with associated loosening of stones.

Rating:

- 7,8 or 9 NA
- 6 Minor seepage
- 5 Substantial seepage accompanied by stone and mortar deterioration
- 4 Deterioration from seepage appears to be resulting in loosening or loss of stones
- 3 Seepage so severe it appears to be related to the loss of a significant number of stones. Fill material may be visible. Possible small void at interface of fill and intrados.
- 2 Opening due to stone loss has increased and is steadily increasing. There may be a loss of fill material with a significant void.
- 1 Bridge is closed. Imminent failure of arch barrel
- 0 Arch barrel has failed

Appendix G – Stone Masonry Arch Condition Rating Guidelines

8. Delaminations

Stones may delaminate by splitting along a seam. These tend to frequently exist along the unconfined face of the ringstone. They may also occur in the intrados if the orientation of layers is parallel to the underside. Delaminating is primarily a concern because it may result in reduced confinement and cause the loss of adjacent intrados stones.

Rating:

- | | |
|--------|--|
| 8 or 9 | Original stonework rehabilitated and in good condition |
| 6 or 7 | None or minor delaminations |
| 5 | Substantial delaminating resulting in reduced volume of several stones |
| 4 | Stone loss from delaminations may result in loosening and loss of adjacent stones. |
| 3 | Delaminations are so severe that it has resulted in the loss of a substantial number of stones which could affect arch barrel capacity |
| 2 | Opening has increased and is steadily increasing. There may be a loss of fill material |
| 1 | Bridge is closed. Imminent failure of intrados |
| 0 | Arch barrel has failed |

Appendix G – Stone Masonry Arch Condition Rating Guidelines

9. Intrados Rating

Intrados items 1 to 8 in Table 1.0 are considered when determining overall Intrados Rating. The lower item numbers should be weighted more heavily for the rating. If any of Condition Items 1 thru 5 is coded ≤ 4 , the overall Intrados Condition Rating cannot be higher than the lowest rating among these five items. The final rating should be consistent with the definitions given in CONDITION RATE CODES in Section 1A Inspection Condition of Publication 100A.

Appendix G – Stone Masonry Arch Condition Rating Guidelines

B. SPANDREL WALLS / RINGSTONE

1. Changes Since Last Inspection

Additional spandrel wall movement since previous inspection could indicate imminent loss of stability and spandrel wall failure that could result in loss of fill and subsequent roadway failure.

Rating:

- | | |
|---------------|--|
| 6,7,8 or
9 | No changes noted. |
| 5 | Minor extension of cracks, additional small missing stones |
| 4 | New isolated missing stones, minor leaning or bulging of wall noted. |
| 3 | New significant wall movement noted |
| 2 | Substantial advancement of wall movement or stone losses since last inspection. Wall stability affected. |
| 1 | Bridge is Closed. Significant wall movement, and imminent failure |
| 0 | Spandrel wall has failed |

Appendix G – Stone Masonry Arch Condition Rating Guidelines

2. Loss of Fill

Openings in the spandrel wall, partial or complete collapse of the wall could result in a loss of the fill material supporting the roadway. This may require closure of the bridge.

Rating:

- | | |
|-----------------|---|
| 5,6,7,8 or
9 | No loss of fill material. |
| 4 | Small area of fill visible at opening in wall. No loss noted |
| 3 | Substantial area of fill visible, appears stable |
| 2 | Exposed fill has minor losses or appears unstable with losses imminent. |
| 1 | Bridge is Closed. Failure of section of spandrel wall accompanied by loss of roadway fill |
| 0 | Spandrel wall has failed |

Appendix G – Stone Masonry Arch Condition Rating Guidelines

3. Out of Plumb

Transverse forces from fill material may be forcing the spandrel wall outward. The wall may be visibly out of plumb. This condition should be noted and measurements taken so any further movement tracked. The method of measurement shall be noted, and the location where the measurement was taken shall be shown on a sketch.

Rating:

- 8 or 9 Original wall rehabilitated and in good condition
- 6 or 7 Wall vertical or only slightly leaning.
- 5 Visible movement of wall but does not appear to be threatening stability
- 4 Measurable movement. There may be associated cracking.
- 3 Significant movement. Stability of wall is beginning to be affected
- 2 As a result of movement there appears to be the potential for the collapse of the spandrel wall.
- 1 Bridge is closed. Imminent failure of wall
- 0 Spandrel wall has failed.

Appendix G – Stone Masonry Arch Condition Rating Guidelines

4. Misalignment

Any indication of misalignment in the normal curvature of ringstone could indicate a serious problem related to spandrel wall movement.

Rating:

- 8 or 9 Original stones or replaced stones are in good condition
- 6 or 7 No visible or minor misalignment of ringstone curvature
- 5 Smooth curvature of ring seems to have been altered but there is no indication of spandrel wall or intrados problems
- 4 Altered curvature is accompanied by some visible movement of spandrel wall or intrados
- 3 Ring misalignment appears to be related to significant movement of spandrel wall or intrados
- 2 Serious movement of spandrel wall or arch barrel related to ringstone deterioration
- 1 Bridge is closed. Imminent collapse of spandrel wall, arch ring or adjacent intrados
- 0 Arch ring collapse accompanied by arch barrel or spandrel wall failure

Appendix G – Stone Masonry Arch Condition Rating Guidelines

5. Bulge

A bulge in spandrel wall is likely due to the same transverse forces described for Item B.3 (Out of Plumb) and raises the same concerns. Bulge can be measured using a plumb bob, level or similar method. The method of measurement and locations where measurements were taken shall be clearly shown on a sketch.

Rating:

- 8 or 9 Original wall rehabilitated and in good condition
- 6 or 7 No bulging or only minor bulging visible.
- 5 Visible bulging of wall but does not appear to be threatening stability
- 4 Measurable movement. There may be associated cracking.
- 3 Significant movement. Stability of wall is beginning to be affected
- 2 As a result of movement there appears to be the potential for the collapse of the spandrel wall.
- 1 Bridge is closed. Imminent failure of wall
- 0 Spandrel wall has failed.

Appendix G – Stone Masonry Arch Condition Rating Guidelines

6. Missing Stones

Isolated missing stones in the spandrel walls are usually not a significant concern; however a substantial opening created by loss of stones reduces the support and confinement of adjacent stones and could result in accelerated movement of the wall. When this item is rated 4 or less, a sketch of a reflected view should be made which shows location and dimensions of areas with missing stones.

Rating:

6,7,8 or 9	None
5	A few random small missing stones
4	Moderate opening in wall due to missing stones. There are no associated bulges. Small area of fill may be visible.
3	Stability of wall could be affected by loss of stones. As a result of the openings, loss of additional stones appears imminent.
2	The wall stability is seriously threatened. There may be a loss of fill material
1	Bridge is Closed. Imminent failure of spandrel wall
0	Spandrel wall has failed

Appendix G – Stone Masonry Arch Condition Rating Guidelines

7. Cracks

Cracks in spandrel walls may be associated with transverse forces generated by the fill material. Less frequently, they may be related to a general vertical movement. Either case should be noted and it should be indicated if they appear to be due to movement of spandrel wall or intrados. When rated 4 or less, there should be a sketch showing the extent and width of cracks. For wide cracks, install marker reference points on both sides of the crack and record the distance between the markers. Provide a sketch showing the marker locations and give a description of the marker type.

Rating:

- 8 or 9 Original wall rehabilitated and in good condition
- 6 or 7 No cracks or fine cracks
- 5 Only medium width cracks visible
- 4 Wide cracks up to a maximum of ½". There may be some associated minor movement of the spandrel wall
- 3 Wide cracks or gaps appearing which has resulted in loosening or movement of adjacent stones
- 2 Wide cracks are coincident with significant movement of spandrel wall.
- 1 Bridge is closed. Imminent collapse of spandrel wall
- 0 Spandrel wall has failed.

Appendix G – Stone Masonry Arch Condition Rating Guidelines

8. Missing Mortar

A significant mortar loss will result in a loosening of stones and potentially stones being dislodged from the spandrel wall.

Rating:

- 8 or 9 Original wall rehabilitated and in good condition
- 6 or 7 None or minor mortar loss
- 5 Substantial loss of moderate depth
- 4 Deep loss over significant area which may have resulted in or contributed to loosening of stones.
- 3 Mortar material is missing to such an extent that a number of stones may be loosening or have already been dislodged from wall.
- 2 Missing stones are affecting stability of spandrel wall. Loss of stones has increased and is steadily worsening. There may be a loss of fill material.
- 1 Bridge is closed. Imminent failure of intrados or spandrel wall
- 0 Arch barrel or spandrel wall has failed

Appendix G – Stone Masonry Arch Condition Rating Guidelines

9. SPANDREL WALL / RINGSTONE RATING

SPANDREL WALL / RINGSTONE items 1 to 8 are considered when determining overall condition rating. The lower item numbers should be weighted more heavily for the rating. The final rating should be consistent with the definitions given in CONDITION RATE CODES in Section 1A Inspection Condition of Publication 100A.

Appendix G – Stone Masonry Arch Condition Rating Guidelines

C. OVERALL SPAN RATING

Span rating is based on the lower value of the Intrados and Spandrel Wall/Ringstone condition Rating

D. OVERALL SUPERSTRUCTURE/CULVERT RATING (1A04/1A03)

Superstructure/culvert rating for bridge is lowest overall span rating.

Appendix G – Stone Masonry Arch Condition Rating Guidelines

Overall and Component Condition Rating Tables

Table 1.0 is used for recording the condition codes for the various intrados, spandrel wall and ringstone elements. The table includes separate boxes for assigning the overall coding of intrados and spandrel wall/ringstone.

Tables 2.0 & 3.0 are field aids for the bridge inspectors. They summarize, in tabular form, the information given in the CONDITION RATING GUIDELINES.

Appendix G – Stone Masonry Arch Condition Rating Guidelines

TABLE 1.0 – Overall Superstructure/Culvert Rating								
				CONDITION RATING				
SPAN				1	2	3	4	
INTRADOS	1*	*** Changes Since Last Inspection						
	2*	Bulge						
	3*	Cracks - Transverse						
	4*	Cracks – Longitudinal & Skewed	Interior					
			Outboard					
	5*	Missing Stones						
	6	Missing Mortar						
	7	Seepage						
	8	Delaminations						
Intrados Rating								
SPANDELRWALL / RINGSTONE	1*	Changes Since Last Inspection						
	2*	Loss of Fill						
	3*	Misalignment						
	4*	Out of Plumb						
	5*	Bulge						
	6*	Missing Stones						
	7	Cracks						
	8	Missing Mortar						
	Spandrel Wall / Ringstone Rating							
** OVERALL SPAN RATING								

Overall Superstructure/Culvert Rating	
---------------------------------------	--

* If any condition with an asterisk has a condition rating ≤ 4 , the associated overall rating for Intrados and Spandrel Wall/Ringstone cannot be higher than the lowest rating among these items.

** Overall Span Rating is the Lower Rating of the Intrados and Spandrel Wall/Ringstone

*** When Changes Since the Last Inspection is coded ≤ 4 , the item that has changed shall be coded no higher than the changes code.

NOTE: Table 1.0 does not account for scour in the culvert rating. Inspectors need to consider scour if it has affected the overall condition of the culvert.

Appendix G – Stone Masonry Arch Condition Rating Guidelines

TABLE 2.0 – Intrados Condition Rating Summary

		INTRADOS							
	RATING	1	2	3	4	5	6	7	8
		CHANGES	BULGE	TRANSV. CRACKS(4)	LONG. CRACKS (3)	MISSING STONES	MISSING MORTAR	SEEPAGE	DELAMINATION
					OUTBOARD, INTERIOR, SKEWED				
LIGHT	9	None	None	None	None (1)	None (1)	Joints repointed	None	None (1)
	8	None	None	None	None (1)	None (1)	Joints repointed	None	None (1)
	7	None	None	None	None	None	None	None	None
MODERATE	6	None	None	Short ≤ length of 1 stone	Few fine cracks	Random small stones	Minor losses	Minor	Minor
	5	Minor crack extension or additional small missing stones	None	Short/ Isolated	Few medium width	A few small stones	Substantial losses of moderate depth	Substantial seepage with some mortar deterioration	Substantial volume loss to several stones
SEVERE	4	* Mod crack widening, additional isolated missing stones	Slight bulging or geometric distortion	Mod to long crack	Few wide, minor loosening of stones	Moderate opening in intrados	Deep losses over significant area/stones loosened	Seepage has resulted in some loosening of stones	Loosening stones due to delamination
	3	* New significant bulging, transverse or long. Crack	Advanced bulging or distortion with cracking	Mod to long with minor bulge	Wide w/adjacent loose or missing stones	Significant opening, further losses imminent	Mortar loss related to significant number of loose stones	Significant stone loss associated with seepage	Severe delam affecting load capacity
CRITICAL	2***	* Significant changes; possible need to close bridge	Distortion. Approaching possible collapse	Wide with significant bulge	Significant with losses of stones	Significant losses possibly affecting structural capacity	Missing mortar results in serious stone loss	Serious losses associated with seepage	Structural capacity seriously affected by delaminations
	1**	*Imminent intrados failure	Imminent intrados failure associated with distortion	Imminent intrados failure	Imminent intrados failure	Imminent intrados failure	Imminent failure due to loss of stones	Imminent failure due to loss of stones	Imminent failure due to loss of stones
	0	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)

* When changes code is ≤ 4 then item that has changed can be coded no higher than the changes code

** Condition Code 1 indicates the bridge is closed

*** Condition Code 2 indicates advanced deterioration and may require closure of bridge until repairs are made

(1) Repaired or rehabilitated

(3) Longitudinal cracks are parallel to centerline roadway

Appendix G – Stone Masonry Arch Condition Rating Guidelines

(2) Structure failed

(4) Transverse cracks are parallel to centerline roadway

TABLE 3.0 – Spandrel Wall /Ringstone Condition Ratings

	RATING	SPANDREL WALL / RINGSTONE							
		1	2	3	4	5	6	7	8
		CHANGES	LOSS OF FILL	OUT OF PLUMB	MISALIGNMENT	BULGE	MISSING STONES	CRACKS	MISSING MORTAR
LIGHT	9	None	None	None (1)	None(1)	None (1)	None	None (1)	None (1)
	8	None	None	None (1)	None(1)	None (1)	None	None (1)	None (1)
	7	None	None	None	None	None	None	None	None
MODERATE	6	None	None	Slight	Slight	Random small	None	Few fine	Minor
	5	Minor crack or small missing stones	None	Minor, wall still stable	Minor , no spandrel wall problems	A few stones, visibly bulged	A few small missing stones	Few medium width	Substantial losses of moderate depth
SEVERE	4	* New minor movement, isolated missing stones, moderate cracks	Small area of fill visible, no losses	Measurable movement, possible associated cracks	Some misalignment with some associated span. Wall movement	Measurable movement, possible associated cracks	Moderate opening, no associated bulge	Wide cracks, some associated movement	Deep losses over significant area/stones loosened
	3	* Significant new movement or stone losses	Substantial visible fill, appears stable	Significant movement, wall stability affected	Significant ringstone misalignment	Significant movement affecting stability	Wall stability being affected by missing stones	Wide cracks with movement or missing stones	Mortar loss related to significant number of loose stones
CRITICAL	2	* New movement or loss of stones threatens wall stability	Exposed fill appears unstable	Potential collapse due to movement	Ringstone movement associated with serious movement of spandrel wall	Substantial movement, possible wall collapse	Wall stability seriously threatened. May be loss of fill	Wide cracks with significant movement or significant number of missing stones	Missing mortar results in serious stone loss
	1**	* Imminent spandrel wall failure and loss of fill	Serious loss of fill material	Imminent spandrel wall failure and loss of fill	Imminent spandrel wall failure associated with ringstone losses	Imminent spandrel wall failure and loss of fill	Imminent spandrel wall failure and loss of fill	Imminent spandrel wall failure and loss of fill	Imminent failure due to loss of stones
	0	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)

* When changes code is ≤ 4 then item that has changed can be coded no higher than the changes code

** A condition code 1 indicates the bridge is closed

(1) Repaired or rehabilitated

(2) Structure failed

**Appendix G – Stone Masonry Arch
Condition Rating Guidelines**

FIELD NOTE SHEETS

Field note sheets provide specific locations for recording comments on condition of intrados, spandrel wall/ringstone.

Appendix G – Stone Masonry Arch Condition Rating Guidelines

Span ___

Intrados

Code

Changes

Bulge

Crack-Tran

Crack Interior

Crack Outboard

Missing Stones

Missing Mort

Seepage

Delam

Additional Notes:

Appendix G – Stone Masonry Arch Condition Rating Guidelines

Span ___

Spandrel Wall/
Ringstone

Code

Changes

Loss of Fill

Misalignment

Out of Plumb

Bulge

Missing Stones

Cracks

Missing Mort

Additional Notes:

Appendix H

National Bridge Inventory Bridge Elements

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APPENDIX H

NATIONAL BRIDGE INVENTORY BRIDGE ELEMENTS

Preface

PennDOT conducts element level bridge inspection using FHWA's Specification for the National Bridge Inventory Bridge Elements (SNBIBE) and AASHTO's Manual for Bridge Elements Inspection (MBEI).

Appendix H is separated into two parts; the first part, used with permission from AASHTO, consists of Sections 1.1 through 1.5 from the MBEI. Part 1 provides background information on general bridge element philosophy, element types and instructions on how to use the MBEI. The second part provides additional guidance and clarification with regards to element measurements, scale factors and definitions used specifically in Pennsylvania.

Part 1 – AASHTO Manual for Bridge Element Inspection

Section 1: BACKGROUND

1.1 - Condition Assessment Philosophy: Multipath and Defect Concepts

The Manual for Bridge Element Inspection builds on the element-level condition assessment methods developed in the AASHTO Guide for Commonly Recognized Structural Elements. Improvements have been made to fully capture the condition of the elements by reconfiguring the element language to utilize multiple distress paths within the defined condition states. The multipath distress language provides the means to fully incorporate all possible defects within the overall condition assessment of the element. The overall condition of an element can be utilized in this aggregate form, or broken down into specific defects present as desired by the agency for Bridge Management System (BMS) use.

The MBEI provides a comprehensive set of bridge elements that is designed to be flexible in nature to satisfy the needs of all agencies. The complete set of elements captures the components necessary for an agency to manage all aspects of the bridge inventory utilizing the full capability of a BMS.

The element set presented within includes two element types identified as National Bridge Elements (NBEs) or Bridge Management Elements (BMEs). The combination of these two element types comprise the full AASHTO element set. All of the elements, whether they are NBEs or BMEs, have the same general condition assessment characteristics:

1. Standard number of condition states is four.
2. The standard condition states are good, fair, poor, and severe general descriptions.
3. Units of measure are length in feet, area in square feet, and each for enumerated elements.

1.2 - National Bridge Elements (NBEs)

The National Bridge Elements represent the primary structural components of bridges necessary to determine the overall condition and safety of the primary load carrying members. The NBEs are a refinement of the deck, superstructure, substructure, and culvert condition ratings defined in the Federal Highway Administration's Recording and Coding Guide for the Structure Inventory and Appraisal of the Nation's Bridges. Additional elements included in this section are bridge rail and bearings. The NBEs are designed to remain consistent from agency to agency across the country in order to facilitate and standardize the capture of bridge element conditions at the national level. In order to capture the

H-1

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APPENDIX H

NATIONAL BRIDGE INVENTORY BRIDGE ELEMENTS

diversity of new element design types and materials, many elements in this category have an “other” element type defined.

1.3 - Bridge Management Elements (BMEs)

Bridge Management Elements include components of bridges such as joints, wearing surfaces, and protective coating systems and deck/slab protection systems that are typically managed by agencies utilizing Bridge Management Systems. The BMEs are defined with a recommended set of condition assessment language that can be modified to suit the agencies’ needs as these elements are not intended to be utilized for the purposes of national policy-making. The BMEs defined within the MBEI were purposefully left fairly general in nature to provide the flexibility to develop agency specific elements that best suit the local bridge management practices. Agencies may choose to develop additional BMEs as necessary following the agency-developed element conventions discussed in Appendix A. When considering additional elements, the agency should consider such factors as element performance, deterioration rates, feasible actions, and preservation costs, as well as the practical considerations of training and inspection costs.

1.4 - Agency Developed Elements (ADEs)

The elements presented within provide the flexibility for an agency to define custom elements in accordance with the defined element framework that may be sub-elements of NBEs or BMEs, or may be agency-defined elements without ties to the elements defined in the MBEI.

By defining a comprehensive set of bridge elements necessary for robust bridge management and the minimum set of elements necessary to assess the condition of primary components of bridges, the MBEI provides a flexible element set that can be tailored to the needs of all agencies. The identification numbers 800 and above are not used in the MBEI for any elements and are reserved for agency purposes

1.5 - How to Use the MBEI

Bridge inspection based on the MBEI consists of defining the elements (pieces of the bridge) and total quantities that exist at each bridge. The condition of each element is determined by performing a field inspection and recording quantities of the element that have identified defects that correlate to the severity of the defects defined in the particular condition state definition of the MBEI. The condition assessment is complete when the appropriate portion of the total quantity is stratified over the defined condition states. For agencies utilizing bridge management systems (BMSs), the appropriate element defects and environment shall be recorded for use in deterioration modeling.

In the MBEI, the element represents the aggregate condition of the defined element inclusive of all defects. The specific listing of all defects is optional; however, the element condition must be inclusive of all defined defects. Element defects are typically to be used when the element reaches Condition State 2 or lower and they essentially act to break down the overall element condition into one or more specific observed problems. The defects defined within the MBEI shall always assume the units of the element with which they are associated. For example, the scour defect may be applied to a column or a pier wall. The defect language is the same for both elements; however, the units for the column defect would be each and the units for the pier wall would be linear feet. In some cases, multiple defects may operate in the same defined space. In this case, the inspector shall report the defect in the most severe condition state. If two defects in the same condition state operate in the same defined space, the inspector shall determine the predominant defect for reporting. For example, if a reinforced concrete bridge deck is cracked throughout and also has a spall in a portion of the deck, the spalling would likely be determined to be the predominant defect.

H-2

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APPENDIX H NATIONAL BRIDGE INVENTORY BRIDGE ELEMENTS

The MBEI attempts to cover the vast majority of all bridge elements found on highway bridges in the United States. During the course of an inspection, the inspector may find materials or elements that are not defined. In these cases, the inspector should use judgment to select the closest element match or use the “other” element type. In a similar vein, the inspector should use judgment when utilizing the condition state defect definitions. There may be cases when the specific condition observed in the field is not defined in the MBEI. In these cases, the inspector should use the general description of the condition states to determine the appropriate condition.

The granularity of the defect details is typically not specified with defect descriptive language for Condition State 4, as this state is reserved for severe conditions that are beyond the specific defects defined for Condition States 1 through 3. Elements with a portion or all of the quantity in Condition State 4 may often have load capacity implications warranting a structural review. Within the MBEI, the term “structural review” is defined as a review by a person qualified to evaluate the field observed conditions and make a determination of the impacts of the conditions on the performance of the element. Structural reviews may include a review of the field inspection notes and photographs, review of as-built plans, or analysis as deemed appropriate to evaluate the performance of the element. Agencies may establish additional guidance to aid the inspector in determining the field circumstances where structural review is warranted, taking into consideration the education, training, and experience of their inspection staff.

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APPENDIX H NATIONAL BRIDGE INVENTORY BRIDGE ELEMENTS

Part 2

Defect Code Recording in Pennsylvania

Part 1 of this appendix reproduces Sections 1.1 through 1.5 of the MBEI; Section 1.5 explains how inspectors are to use the MBEI and it states “the specific listing of all defects is optional.” However, PennDOT has decided to require the collection of specific element defect codes in order to increase the accuracy and consistency of both defect code condition state and element condition state quantity distributions. This information will be utilized to support bridge management deterioration modeling, forecasting and evaluation.

All ADEs, most NBEs and certain BMEs have Condition State Definitions that require a structural review if defect quantities exist in the Severe Condition State (CS-4). If there is no impact on strength or serviceability after a structural review has been completed, then the quantity should be moved to Poor CS-3 Poor (does not require a structural review) to be consistent with the condition state definitions. This statement does not apply to protective systems and coatings, wearing surfaces, or joints. In the event a CS-4 quantity impacts the load rating of a structure, the quantity of shall remain in CS-4 if the bridge is posted because of the CS-4 quantity.

The **Damage*** defect condition state descriptions below are to be utilized in Pennsylvania. It is modified from the original description in AASHTO’s Manual for Bridge Element Inspections is applicable to elements which do NOT require a structural review for CS-4:

Defect	Condition States			
	1	2	3	4
	GOOD	FAIR	POOR	SEVERE
Damage (Impact Related) (7000)	Not applicable	The element has impact damage. The damage caused by the impact has been assessed as Condition State 2 based on the material-specific defects description(s); however, Damage is the predominate defect recorded for this location on the element.	The element has impact damage. The damage caused by the impact has been assessed as Condition State 3 based on the material-specific defects description(s); however, Damage is the predominate defect recorded for this location on the element.	The element has impact damage. The damage caused by the impact has been assessed as Condition State 4 based on the material-specific defects description(s); however, Damage is the predominate defect recorded for this location on the element.

H-4

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APPENDIX H NATIONAL BRIDGE INVENTORY BRIDGE ELEMENTS

The **Corrosion*** defect condition state descriptions below are to be utilized in Pennsylvania. They are modified from the original description in AASHTO's Manual for Bridge Element Inspections:

Defect	Condition States			
	1 GOOD	2 FAIR	3 POOR	4 SEVERE
Corrosion (1000)	None.	Freckled Rust. Corrosion of the steel has initiated.	Measurable (\geq 1/16") section loss is evident or pack rust is present but does not warrant structural review.	The condition warrants a structural review to determine the effect on strength or serviceability of the elements or bridge. Or a structural review has been completed and the defects impact strength or serviceability of the elements or bridge. If the condition is the result of impact damage, then damage is the predominant defect recorded for this location on the element.

Element Measurements and Scale Factors

When calculating element quantities, use the following hierarchy to obtain measurements:

- 1) As Built Drawings
- 2) Design Drawings
- 3) Field measurements
- 4) Field Estimation

All elements and corresponding dimensions used for quantity calculation shall be clearly identified on the existing bridge plans and placed in the bridge file for future reference. When bridge plans do not exist, the elements and quantity calculation methodology shall be clearly documented with sketches and notes placed in the bridge file.

When assigning condition state measurements, record the length to the nearest foot and area to the nearest square foot. When taking scale factor measurements, record to the nearest tenth of a foot. A primary unit of measurement quantifies each element. For cost tracking purposes, elements may be further quantified with an additional component known as the scale factor. The scale factor is a multiplier to account for the relative sizes of the element in order to develop a more accurate estimate.

The elements to be further quantified with a scale factor are beam/ girder, abutment, wing and retaining walls, pier wall, and column elements. The procedure for calculating scale factor measurements is provided within the Element Type description below, if applicable based upon the element.

H-5

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APPENDIX H NATIONAL BRIDGE INVENTORY BRIDGE ELEMENTS

Element Types

Decks

The terms "deck" and "slab" are sometimes used incorrectly to describe the same bridge component. A deck is supported by a superstructure unit (beams, girders, etc.), whereas a slab is a superstructure unit supported by a substructure unit (abutments, piers, bents, etc.). A deck can be loosely defined as the top surface of the bridge, which carries the traffic. A slab serves as the superstructure and the top surface that carries the traffic.

For Northeast Extreme Tee (NEXT) Beams, PennDOT does not allow the top flange of the NEXT Beam to function as the deck. The approved products drawings associated with the NEXT Beam indicate the top flange is intended to act as a deck form only. Therefore, a NEXT Beam or a similar type of beam/girder will be shown as Element 109 and a separate deck element is required. For adjacent, non-composite box beams where the top of the box acts as the deck, both Elements 104 (Prestressed Concrete Closed Web/Box Girder) and Element 15 (Prestressed Concrete Top Flange) should be inventoried and assessed.

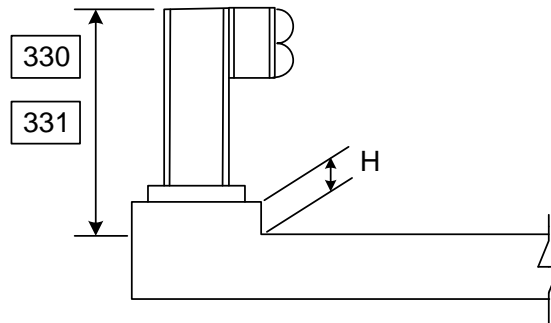
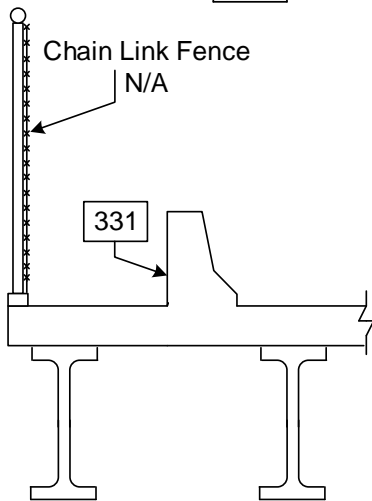
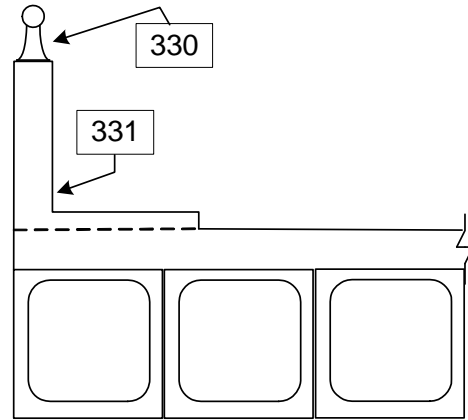
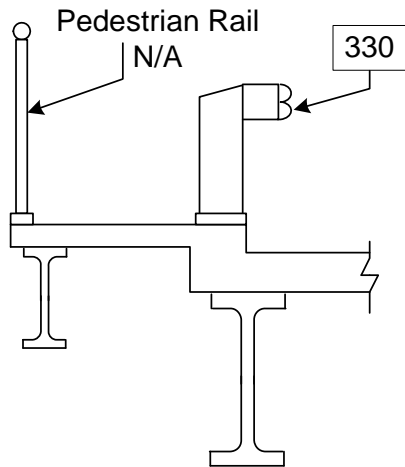
For single span structures, deck length is measured from paving notch to paving notch or back to back of backwalls. For multiple span structures, the deck length measurement is dependent upon the structure unit location. The deck length for end units is measured from paving notch or back of backwall to centerline of pier, while the deck length for interior units is measured from centerline of pier to centerline of pier.

For this element, deck width is equal to the out-to-out width.

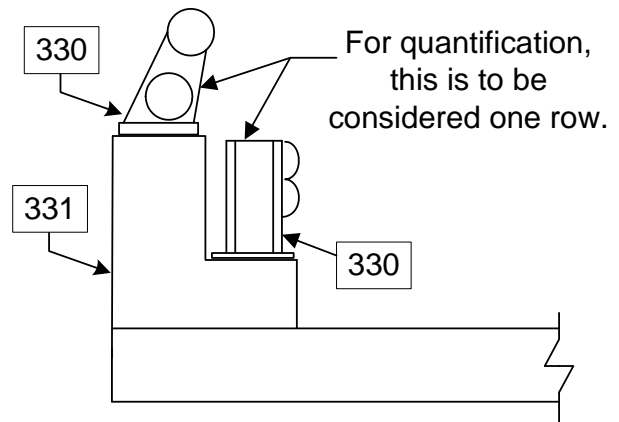
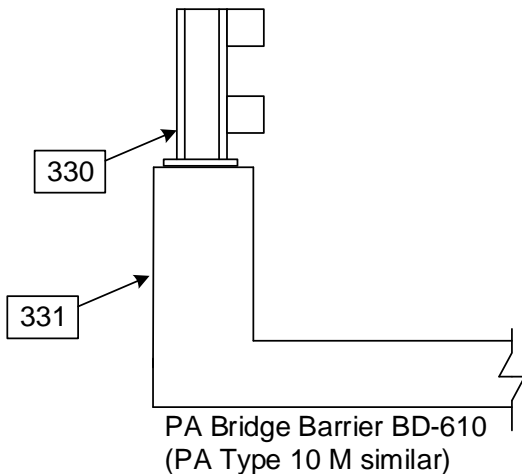
Bridge Railing

The quantity for railings is the length of each rail system measured from paving notch to paving notch or back to back of backwalls. If both railings are of the same type, the entire quantity for both rails should be placed in the appropriate railing element. When two railings types are used in conjunction with one another, i.e., metal railing mounted on a concrete railing, both elements should be recorded. The quantity of railing is the number of rows of bridge rail on the bridge times the length of a bridge. For example, on a two lane, undivided highway, the bridge railing would be placed on either side of the bridge. Regardless of the number of rails per row, each side would be considered one row. Furthermore, when there is a joint between median barriers along a divided highway, the barrier will be quantified as two separate rows. When offsets are used between support posts and guide rail, the condition of the offsets, regardless of material type, should be documented using the Connection Defect Code (1020). Additional guidance can be found in the MBEI Appendix B. Coding examples of railing are provided on the next page.

APPENDIX H NATIONAL BRIDGE INVENTORY BRIDGE ELEMENTS



If $H < 12''$ inventory railing as 330
If $H > 12''$ inventory railing as 330 and 331



Notes:

1. 331 Element Number
2. Vertical measurements shall be taken to top of deck or wearing surface, if present.

APPENDIX H

NATIONAL BRIDGE INVENTORY BRIDGE ELEMENTS

Joints

The quantity for joints shall be the total length of joint from out-to-out of deck along the structure skew to the nearest foot. If various types of joints are present, code the linear feet of each type of joint that is visible. If a joint was originally constructed with a compression seal, but the seal has fallen out, do not code the joint as an open joint. It should be coded as a compression joint with a low condition state.

Beams, Girders and Stringers

The length of beams, girders and stringers shall be measured from centerline of bearing to centerline of bearing. If the span length varies (e.g. when substructure units are not parallel to each other), the average span length may be used.

Beams, girders and stringers have a primary unit of measurement of feet, which is measured along their length. They also have a scale factor measurement for average depth, in feet, to identify very large beams versus smaller ones.

Beams, girders or stringers that do not support the deck directly, should not be counted in the total element quantity. Examples of this would include stringers on a truss that support only the sidewalk or instances when a longitudinal joint is present between the sidewalk and the deck.

Girder Line Determination

Two methods of counting girders are in use: the "conventional" method and the AASHTO method. The conventional method will be used for Pennsylvania. The examples shown in Figure 1 (next page) demonstrate the conventional method for several common girder types.

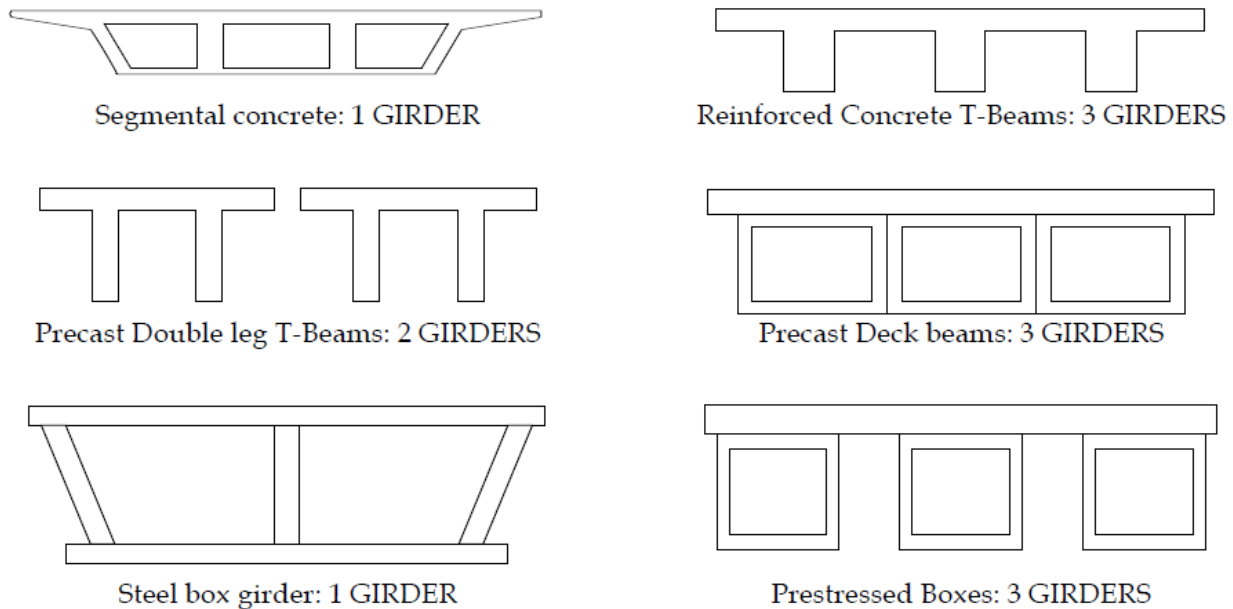


Figure 1: Girder Quantity Examples

APPENDIX H NATIONAL BRIDGE INVENTORY BRIDGE ELEMENTS

Truss and Open Spandrel Arch Quantities

All measurements of a truss and an open spandrel arch are along the horizontal projection. This convention includes the quantities for deterioration measurements.

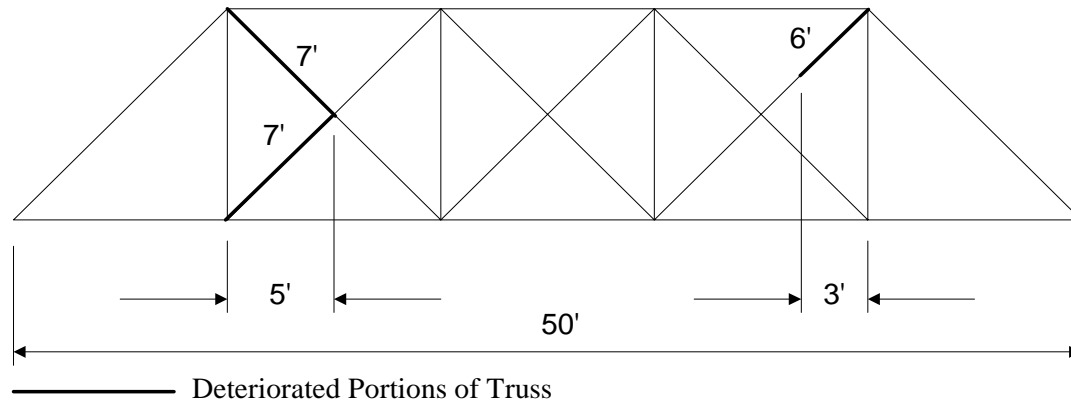


Figure 2: Truss Quantity Example

For the example shown in Figure 2, the total length of the truss is 50'. The total quantity of the condition state for the deterioration is $5' + 3' = 8'$.

Columns

Columns are to be counted as each item, as long as the width of the column is less than ten feet in width. For widths 10 feet and greater, refer to Pier Walls below. The scale factor measurement for columns is the average height of column from the top of footing to the bearing seat or bottom of pier cap, if present. If the footing is below the ground line and the depth cannot be determined from plans, use the length of the exposed portion plus 3 feet for the scale factor measurement.

Since columns are assessed as an EACH (EA) item, it is better to assess the condition and assign a condition state similar to component condition ratings and not downgrade the condition based on localized defects. In other words, apply a general condition rating approach of good, fair, poor or severe and then apply the defect code concepts if the column is considered fair, poor or severe. If there are localized areas of deterioration, use the defect code notes to specify the location and condition of that specific defect.

Pier Walls

The pier wall element should be used for any rectangular RC support pier shaft that is not part of a Pier Bent configuration. When the pier supporting member is ten feet or greater in width, the component is defined as a Pier Wall. A Pier Wall may or may not have a Pier Cap. A typical example of a pier wall is the pier shaft of a large hammerhead pier.

The scale factor measurement for pier walls is the average height of the pier wall from the top of the footing to the bearing seat if there is no pier cap. If there is a pier cap, the average height is from the top of the footing to the bottom of the pier cap. If the footing is below the ground line and the depth cannot be determined from plans, use the height of the exposed portion plus 3 feet for the scale factor measurement.

APPENDIX H NATIONAL BRIDGE INVENTORY BRIDGE ELEMENTS

Abutments

Abutments are measured along the entire face of the abutment and back along the wingwalls to the first vertical joint. If the wingwalls are integral (no joints), the quantity will include the length of the abutment plus the entire length of each wingwall. If the wingwalls are not integral, the abutment quantity will include only the length of abutment and a separate element must be coded for the wingwalls.

The scale factor measurement for abutments is the average height of the abutment stem from the top of the footing to the bearing seat. If the footing is below the ground line and the depth cannot be determined from plans, use the height of the exposed portion plus 3 feet for the scale factor measurement.

Wingwalls

Non-integral wingwalls are measured along the face from the vertical joint at the abutment to the end of the wingwall face.

The scale factor measurement for wingwalls is the average height of the wall stem from the top of the footing to the top of the wall. If the footing is below the ground line and the depth cannot be determined from plans, use the height of the exposed portion plus 3 feet.

Structure Units

Structures (bridges, culverts, etc.) can be divided into one or more smaller units, called structure units. A structure unit is any logical grouping of structure components usually having the same structural design and material. In Pennsylvania, each span of a structure is considered to be an individual structure unit.

When coding elements, the quantity for each element on each structure unit is required. Elements that are common to two spans are assigned to the lowest numbered span that they share. For example, the pier for a two-span bridge would be placed with span 1.

Environments

At this time, all Pennsylvania bridge elements will be placed in environment 3 (moderate). For additional information refer to Section 3.10 of the MBEI.

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AASHTO/PennDOT Bridge Elements, Defects, and Condition States (2015 Interims)

Decks/Slabs (NBE's)		
Element #	Element Name	Units
12	Reinforced Concrete Deck	AREA (sq. ft.)
13	Prestressed Concrete Deck	AREA (sq. ft.)
15	Prestressed Concrete Top Flange	AREA (sq. ft.)
16	Reinforced Concrete Top Flange	AREA (sq. ft.)
28	Steel Deck with Open Grid	AREA (sq. ft.)
29	Steel Deck with Concrete Filled Grid	AREA (sq. ft.)
30	Steel Deck Corrugated/Orthotropic/Etc.	AREA (sq. ft.)
31	Timber Deck	AREA (sq. ft.)
38	Reinforced Concrete Slab	AREA (sq. ft.)
54	Timber Slab	AREA (sq. ft.)
60	Other Deck	AREA (sq. ft.)
65	Other Slab	AREA (sq. ft.)

Wearing Surface and Protective System (BME's)		
Element #	Element Name	Units
510	Wearing Surface	AREA (sq. ft.)
515	Steel Protective Coating	AREA (sq. ft.)
520	Concrete Reinforcing Steel Protective System	AREA (sq. ft.)
521	Concrete Protective Coating	AREA (sq. ft.)

Joints (BME's)		
Element #	Element Name	Units
300	Strip Seal Expansion Joint	LENGTH (ft.)
301	Pourable Joint Seal	LENGTH (ft.)
302	Compression Joint Seal	LENGTH (ft.)
303	Assembly Joint with Seal	LENGTH (ft.)
304	Open Expansion Joint	LENGTH (ft.)
305	Assembly Joint without Seal	LENGTH (ft.)
306	Other Joint	LENGTH (ft.)

Bearings (NBE's)		
Element #	Element Name	Units
310	Elastomeric Bearing	EACH
311	Movable Bearing	EACH
312	Enclosed/Concealed Bearing	EACH
313	Fixed Bearing	EACH
314	Pot Bearing	EACH
315	Disk Bearing	EACH
316	Other Bearing	EACH

Approach Slab (BME's)		
Element #	Element Name	Units
320	Prestressed Concrete Approach Slab	AREA (sq. ft.)
321	Reinforced Concrete Approach Slab	AREA (sq. ft.)

Superstructures (NBE's)		
Element #	Element Name	Units
102	Steel Closed Web/Box Girder	LENGTH (ft.)
104	Prestressed Concrete Closed Web/Box Girder	LENGTH (ft.)
105	Reinforced Concrete Closed Web/Box Girder	LENGTH (ft.)
106	Other Closed Web/Box Girder	LENGTH (ft.)
107	Steel Open Girder/Beam	LENGTH (ft.)
109	Prestressed Concrete Open Girder/Beam	LENGTH (ft.)
110	Reinforced Concrete Open Girder/Beam	LENGTH (ft.)
111	Timber Open Girder/Beam	LENGTH (ft.)
112	Other Open Girder/Beam	LENGTH (ft.)
113	Steel Stringer	LENGTH (ft.)
115	Prestressed Concrete Stringer	LENGTH (ft.)
116	Reinforced Concrete Stringer	LENGTH (ft.)
117	Timber Stringer	LENGTH (ft.)
118	Other Stringer	LENGTH (ft.)
120	Steel Truss	LENGTH (ft.)
135	Timber Truss	LENGTH (ft.)
136	Other Truss	LENGTH (ft.)
141	Steel Arch	LENGTH (ft.)
142	Other Arch	LENGTH (ft.)
143	Prestressed Concrete Arch	LENGTH (ft.)
144	Reinforced Concrete Arch	LENGTH (ft.)
145	Masonry Arch	LENGTH (ft.)
146	Timber Arch	LENGTH (ft.)
147	Steel Main Cables	LENGTH (ft.)
148	Secondary Steel Cables	EACH
149	Other Secondary Cable	EACH
152	Steel Floor Beam	LENGTH (ft.)
154	Prestressed Concrete Floor Beam	LENGTH (ft.)
155	Reinforced Concrete Floor Beam	LENGTH (ft.)
156	Timber Floor Beam	LENGTH (ft.)
157	Other Floor Beam	LENGTH (ft.)
161	Steel Pin and Pin & Hanger Assembly or both	EACH
162	Steel Gusset Plate	EACH

Railings (NBE's)		
Element #	Element Name	Units
330	Metal Bridge Railing	LENGTH (ft.)
331	Reinforced Concrete Bridge Railing	LENGTH (ft.)
332	Timber Bridge Railing	LENGTH (ft.)
333	Other Bridge Railing	LENGTH (ft.)
334	Masonry Bridge Railing	LENGTH (ft.)

Substructures (NBE's)		
Element #	Element Name	Units
202	Steel Column	EACH
203	Other Column	EACH
204	Prestressed Concrete Column	EACH
205	Reinforced Concrete Column	EACH
206	Timber Column	EACH
207	Steel Tower	LENGTH (ft.)
208	Timber Trestle	LENGTH (ft.)
210	Reinforced Concrete Pier Wall	LENGTH (ft.)
211	Other Pier Wall	LENGTH (ft.)
212	Timber Pier Wall	LENGTH (ft.)
213	Masonry Pier Wall	LENGTH (ft.)
215	Reinforced Concrete Abutment	LENGTH (ft.)
216	Timber Abutment	LENGTH (ft.)
217	Masonry Abutment	LENGTH (ft.)
218	Other Abutments	LENGTH (ft.)
219	Steel Abutment	LENGTH (ft.)
220	Reinforced Concrete Pile Cap/Footing	LENGTH (ft.)
225	Steel Pile	EACH
226	Prestressed Concrete Pile	EACH
227	Reinforced Concrete Pile	EACH
228	Timber Pile	EACH
229	Other Pile	EACH
231	Steel Pier Cap	LENGTH (ft.)
233	Prestressed Concrete Pier Cap	LENGTH (ft.)
234	Reinforced Concrete Pier Cap	LENGTH (ft.)
235	Timber Pier Cap	LENGTH (ft.)
236	Other Pier Cap	LENGTH (ft.)

Culverts (NBE's)		
Element #	Element Name	Units
240	Steel Culvert	LENGTH (ft.)
241	Reinforced Concrete Culvert	LENGTH (ft.)
242	Timber Culvert	LENGTH (ft.)
243	Other Culvert	LENGTH (ft.)
244	Masonry Culvert	LENGTH (ft.)
245	Prestressed Concrete Culvert	LENGTH (ft.)

Walls (ADE's)		
Element #	Element Name	Units
853	MSE Retaining Wall/Wingwall	LENGTH (ft.)
857	Reinforced Concrete Wingwall/Retaining Wall	LENGTH (ft.)
860	Other Wingwall/Retaining Wall	LENGTH (ft.)
861	Prefabricated Concrete Modular Wall	LENGTH (ft.)

H-11

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Reinforced Concrete - Condition State Definitions				
Defect	CS 1 - Good	CS 2 - Fair	CS 3 - Poor	CS 4 - Severe
Delamination / Spall / Patched Area (1080)	None	Delaminated. Spall 1 in. or less deep or 6 in. or less in diameter. Patched area that is sound.	Spall greater than 1 in. deep or greater than 6 in. diameter. Patched area that is unsound or showing distress. Does not warrant structural review.	The condition warrants a structural review to determine the effect on strength or serviceability of the elements or bridge. Or a structural review has been completed and the defects impact strength or serviceability of the elements or bridge. If the condition is the result of impact damage, then damage is the predominant defect recorded for this location on the element.
Exposed Rebar (1090)	None	Present without measurable section loss.	Present with measurable section loss, but does not warrant structural review.	
Efflorescence / Rust Staining (1120)	None	Surface white without build-up or leaching without rust staining.	Heavy build-up with rust staining.	
Cracking (RC and Other) * (1130)	Insignificant cracks or moderate width cracks that have been sealed.	Unsealed moderate width cracks or unsealed moderate pattern (map) cracking.	Wide cracks or heavy pattern (map) cracking.	
Abrasion / Wear (PSC/RC) (1190)	No abrasion or wearing	Abrasion or wearing has exposed coarse aggregate but the aggregate remains secure in the concrete.	Coarse aggregate is loose or has popped out of the concrete matrix due to abrasion or wear.	
Distortion (1900)	None	Distortion not requiring mitigation or mitigated distortion.	Distortion that requires mitigation that has not been addressed but does not warrant structural review.	
Settlement (4000)	None	Exists within tolerable limits or arrested with no observed structural distress.	Exceeds tolerable limits but does not warrant structural review.	
Scour (6000)	None	Exists within tolerable limits or has been arrested with effective countermeasures.	Exceeds tolerable limits, but is less than the critical limits determined by scour evaluation and does not warrant structural review.	
Damage (Impact Related) (7000)	Not applicable	The element has impact damage. The damage caused by the impact has been assessed as Condition State 2 based on the material-specific defects description(s); however, Damage is the predominate defect recorded for this location on the element.	The element has impact damage. The damage caused by the impact has been assessed as Condition State 3 based on the material-specific defects description(s); however, Damage is the predominate defect recorded for this location on the element.	

Concrete Reinforcing Steel Protective Systems - Condition State Definitions				
Defect	CS 1 - Good	CS 2 - Fair	CS 3 - Poor	CS 4 - Severe
Effectiveness (3600)	Fully effective.	Substantially effective.	Limited effectiveness.	The protective system has failed or is no longer effective.
Damage (Impact Related) (7000)	Not applicable.	The element has impact damage. The damage caused by the impact has been assessed as Condition State 2 based on the material-specific defects description(s); however, Damage is the predominate defect recorded for this location on the element.	The element has impact damage. The damage caused by the impact has been assessed as Condition State 3 based on the material-specific defects description(s); however, Damage is the predominate defect recorded for this location on the element.	The element has impact damage. The damage caused by the impact has been assessed as Condition State 4 based on the material-specific defects description(s); however, Damage is the predominate defect recorded for this location on the element.

Prestressed Concrete - Condition State Definitions				
Defect	CS 1 - Good	CS 2 - Fair	CS 3 - Poor	CS 4 - Severe
Delamination / Spall / Patched Area (1080)	None	Delaminated. Spall 1 in. or less deep or 6 in. or less in diameter. Patched area that is sound.	Spall greater than 1 in. deep or greater than 6 in. diameter. Patched area that is unsound or showing distress. Does not warrant structural review.	The condition warrants a structural review to determine the effect on strength or serviceability of the elements or bridge. Or a structural review has been completed and the defects impact strength or serviceability of the elements or bridge. If the condition is the result of impact damage, then damage is the predominant defect recorded for this location on the element.
Exposed Rebar (1090)	None	Present without measurable section loss.	Present with measurable section loss, but does not warrant structural review.	
Exposed Prestressing (1100)	None	Present without section loss	Present with section loss, but does not warrant structural review.	
Cracking (PSC) * (1110)	Insignificant cracks or moderate width cracks that have been sealed.	Unsealed moderate width cracks or unsealed moderate pattern (map) cracking.	Wide cracks or heavy pattern (map) cracking.	
Efflorescence / Rust Staining (1120)	None	Surface white without build-up or leaching without rust staining.	Heavy build-up with rust staining.	
Abrasion / Wear (1190)	No abrasion or wearing	Abrasion or wearing has exposed coarse aggregate but the aggregate remains secure in the concrete.	Coarse aggregate is loose or has popped out of the concrete matrix due to abrasion or wear.	
Distortion (1900)	None	Distortion not requiring mitigation or mitigated distortion.	Distortion that requires mitigation that has not been addressed but does not warrant structural review.	
Settlement (4000)	None	Exists within tolerable limits or arrested with no observed structural distress.	Exceeds tolerable limits but does not warrant structural review.	
Scour (6000)	None	Exists within tolerable limits or has been arrested with effective countermeasures.	Exceeds tolerable limits, but is less than the critical limits determined by scour evaluation and does not warrant structural review.	
Damage (Impact Related) (7000)	Not applicable	The element has impact damage. The damage caused by the impact has been assessed as Condition State 2 based on the material-specific defects description(s); however, Damage is the predominate defect recorded for this location on the element.	The element has impact damage. The damage caused by the impact has been assessed as Condition State 3 based on the material-specific defects description(s); however, Damage is the predominate defect recorded for this location on the element.	

*The inspector should use judgement when utilizing the condition state defect definitions, especially for prestressed concrete cracking. The crack defect description definitions describe generalized distress, but the inspector should consider width, spacing, location, orientation, and structural or nonstructural nature of the cracking. The inspector should consider exposure and environment when evaluating cracking width.

Reinforced Concrete: In general, cracks less than 0.012 inches can be considered insignificant, cracks ranging from 0.012 to 0.05 inches can be considered moderate, and cracks greater than 0.05 inches can be considered wide.

Prestressed Concrete: In general, prestressed concrete cracks less than 0.004 inches can be considered insignificant and a defect is not warranted, Cracks ranging from 0.004 to 0.009 inches can be considered moderate, and cracks greater than 0.009 inches can be considered

Wearing Surfaces - Condition State Definitions				
Defect	CS 1 - Good	CS 2 - Fair	CS 3 - Poor	CS 4 - Severe
Delamination / Spall/ Patched Area / Pothole (3210)	None.	Delaminated. Spall less than 1 in. deep or less than 6 in. diameter. Patched area that is sound. Partial depth pothole.	Spall 1 in. deep or greater or 6 in. diameter or greater. Patched area that is unsound or showing distress. Full depth pothole.	The wearing surface is no longer effective.
Crack (Wearing Surface) (3220)	Width less than 0.012 in. or spacing greater than 3.0 ft.	Width 0.012-0.05 in. or spacing of 1.0-3.0 ft.	Width of more than 0.05 in. or spacing of less than 1.0 ft.	
Effectiveness (3230)	Fully effective. No evidence of leakage or further deterioration of the protected element.	Substantially effective. Deterioration of the protected element has slowed.	Limited effectiveness. Deterioration of the protected element has progressed.	
Damage (Impact Related) (7000)	Not applicable.	The element has impact damage. The damage caused by the impact has been assessed as Condition State 2 based on the material-specific defects description(s); however, Damage is the predominate defect recorded for this location on the element.	The element has impact damage. The damage caused by the impact has been assessed as Condition State 3 based on the material-specific defects description(s); however, Damage is the predominate defect recorded for this location on the element.	

Bearings - Condition State Definitions				
Defect	CS 1 - Good	CS 2 - Fair	CS 3 - Poor	CS 4 - Severe
Corrosion (1000)	None.	Freckled Rust. Corrosion of the steel has initiated.	Measurable ($\geq 1/16''$) section loss is evident or pack rust is present but does not warrant structural review.	The condition warrants a structural review to determine the effect on strength or serviceability of the elements or bridge. Or a structural review has been completed and the defects impact strength or serviceability of the elements or bridge. If the condition is the result of impact damage, then damage is the predominant defect recorded for this location on the element.
Connection (1020)	Connection is in place and functioning as intended.	Loose fasteners or pack rust without distortion is present but the connection is in place and functioning as intended.	Missing bolts, rivets, broken welds, fasteners or pack rust with distortion but does not warrant a structural review.	
Movement (2210)	Free to move.	Minor restriction.	Restricted but not warranting structural review.	
Alignment (2220)	Lateral and vertical alignment is as expected for the temperature conditions.	Tolerable lateral or vertical alignment that is inconsistent with the temperature conditions.	Approaching the limits of lateral or vertical alignment for the bearing but does not warrant a structural review.	
Bulging, Splitting or Tearing (2230)	None.	Bulging less than 15% of the thickness.	Bulging 15% or more of the thickness. Splitting or tearing. Bearing's surfaces are not parallel. Does not warrant structural review.	
Loss of Bearing Area (2240)	None.	Less than 10%.	10% or more but does not warrant structural review.	
Damage (Impact Related) (7000)	Not applicable.	The element has impact damage. The damage caused by the impact has been assessed as Condition State 2 based on the material-specific defects description(s); however, Damage is the predominate defect recorded for this location on the element.	The element has impact damage. The damage caused by the impact has been assessed as Condition State 3 based on the material-specific defects description(s); however, Damage is the predominate defect recorded for this location on the element.	

Joints - Condition State Definitions				
Defect	CS 1 - Good	CS 2 - Fair	CS 3 - Poor	CS 4 - Severe
Leakage (2310)	None.	Minimal. Minor dripping through the joint.	Moderate. More than a drip and less than free flow of water.	Free flow of water through the joint.
Seal Adhesion (2320)	Fully Adhered.	Adhered for more than 50% of the joint height.	Adhered 50% or less of joint height but still some adhesion.	Complete loss of adhesion.
Seal Damage (2330)	None.	Seal abrasion without punctures.	Punctured or ripped or partially pulled out.	Punctured completely through, pulled out, or missing.
Seal Cracking (2340)	None.	Surface crack.	Crack that partially penetrates the seal.	Crack that fully penetrates the seal.
Debris Impaction (2350)	No debris to a shallow cover of loose debris may be evident but does not affect the performance of the joint.	Partially filled with hard-packed material, but still allowing free movement.	Completely filled and impacts joint movement.	Completely filled and prevents joint movement.
Adjacent Deck or Header (2360)	Sound. No spall, delamination or unsound patch.	Edge delamination or spall 1 in. or less deep or 6 in. or less in diameter. No exposed rebar. Patched area that is sound.	Spall greater than 1 in. deep or greater than 6 in. diameter. Exposed rebar. Delamination or unsound patched area that makes the joint loose.	Spall, delamination, unsound patched area or loose joint anchor that prevents the joint from functioning as intended.
Metal Deterioration or Damage (2370)	None.	Freckled rust, metal has no cracks, or impact damage. Connection may be loose but functioning as intended.	Section loss, missing or broken fasteners, cracking of the metal or impact damage but joint still functioning.	Metal cracking, section loss, damage or connection failure that prevents the joint from functioning as intended.
Damage (Impact Related) (7000)	Not applicable.	The element has impact damage. The damage caused by the impact has been assessed as Condition State 2 based on the material-specific defects description(s); however, Damage is the predominate defect recorded for this location on the element.	The element has impact damage. The damage caused by the impact has been assessed as Condition State 3 based on the material-specific defects description(s); however, Damage is the predominate defect recorded for this location on the element.	The element has impact damage. The damage caused by the impact has been assessed as Condition State 4 based on the material-specific defects description(s); however, Damage is the predominate defect recorded for this location on the element.

Concrete Protective Coating - Condition State Definitions				
Defect	CS 1 - Good	CS 2 - Fair	CS 3 - Poor	CS 4 - Severe
Wear (3510)	None.	Underlying concrete not exposed, coating showing wear from UV exposure, friction course missing.	Underlying concrete is not exposed, thickness of the coating is reduced.	Underlying concrete exposed, treated cracks are exposed.
Effectiveness (3540)	Fully effective.	Substantially effective.	Limited effectiveness.	The protective system has failed or is no longer effective.
Damage (Impact Related) (7000)	Not applicable.	The element has impact damage. The damage caused by the impact has been assessed as Condition State 2 based on the material-specific defects description(s); however, Damage is the predominate defect recorded for this location on the element.	The element has impact damage. The damage caused by the impact has been assessed as Condition State 3 based on the material-specific defects description(s); however, Damage is the predominate defect recorded for this location on the element.	The element has impact damage. The damage caused by the impact has been assessed as Condition State 4 based on the material-specific defects description(s); however, Damage is the predominate defect recorded for this location on the element.

H-13

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Steel - Condition State Definitions				
Defect	CS 1 - Good	CS 2 - Fair	CS 3 - Poor	CS 4 - Severe
Corrosion (1000)	None.	Freckled Rust. Corrosion of the steel has initiated.	Measurable ($\geq 1/16''$) section loss is evident or pack rust is present but does not warrant structural review.	The condition warrants a structural review to determine the effect on strength or serviceability of the elements or bridge. Or a structural review has been completed and the defects impact strength or serviceability of the elements or bridge. If the condition is the result of impact damage, then damage is the predominant defect recorded for this location on the element.
Cracking (1010)	None.	Crack that has self-arrested or has been arrested with effective arrest holes, doubling plates, or similar.	Identified crack exists that is not arrested but does not warrant structural review	
Connection (1020)	Connection is in place and functioning as intended.	Loose fasteners or pack rust without distortion is present but the connection is in place and functioning as intended.	Missing bolts, rivets, or fasteners; broken welds; or pack rust with distortion but does not warrant a structural review.	
Distortion (1900)	None.	Distortion not requiring mitigation or mitigated distortion.	Distortion that requires mitigation that has not been addressed but does not warrant structural review.	
Settlement (4000)	None.	Exists within tolerable limits or arrested with no observed structural distress.	Exceeds tolerable limits but does not warrant structural review.	
Scour (6000)	None.	Exists within tolerable limits or has been arrested with effective countermeasures.	Exceeds tolerable limits, but is less than the critical limits determined by scour evaluation and does not warrant structural review.	
Damage (Impact Related) (7000)	Not applicable.	The element has impact damage. The damage caused by the impact has been assessed as Condition State 2 based on the material-specific defects description(s); however, Damage is the predominate defect recorded for this location on the element.	The element has impact damage. The damage caused by the impact has been assessed as Condition State 3 based on the material-specific defects description(s); however, Damage is the predominate defect recorded for this location on the element.	

Steel Protective Coatings - Condition State Definitions				
Defect	CS 1 - Good	CS 2 - Fair	CS 3 - Poor	CS 4 - Severe
Chalking (3410)	None.	Surface Dulling.	Loss of Pigment.	Not Applicable.
Peeling / Bubbling/ Cracking (3420)	None.	Finish coats only.	Finish and primer coats.	Exposure of bare metal.
Oxide Film Degradation Color /Texture Adherence (weathering steel patina) (3430)	Yellow-orange or light brown for early development. Chocolate- brown to purple-brown for fully developed. Tightly adhered, capable of withstanding hammering or vigorous wire brushing.	Granular texture.	Small flakes, less than 1/2 in. diameter.	Dark black color. Large flakes, 1/2 in. diameter or greater or laminar sheets or nodules.
Effectiveness (3440)	Fully effective.	Substantially effective.	Limited effectiveness.	Failed, no protection of the underlying metal.
Damage (Impact Related) (7000)	Not applicable.	The element has impact damage. The damage caused by the impact has been assessed as Condition State 2 based on the material-specific defects description(s); however, Damage is the predominate defect recorded for this location on the element.	The element has impact damage. The damage caused by the impact has been assessed as Condition State 3 based on the material-specific defects description(s); however, Damage is the predominate defect recorded for this location on the element.	The element has impact damage. The damage caused by the impact has been assessed as Condition State 4 based on the material-specific defects description(s); however, Damage is the predominate defect recorded for this location on the element.

Timber - Condition State Definitions				
Defect	CS 1 - Good	CS 2 - Fair	CS 3 - Poor	CS 4 - Severe
Connection (1020)	Connection is in place and functioning as intended.	Loose fasteners or pack rust without distortion is present but the connection is in place and functioning as intended.	Missing bolts, rivets, broken welds, fasteners or pack rust with distortion but does not warrant a structural review.	The condition warrants a structural review to determine the effect on strength or serviceability of the elements or bridge. Or a structural review has been completed and the defects impact strength or serviceability of the elements or bridge. If the condition is the result of impact damage, then damage is the predominant defect recorded for this location on the element.
Decay / Section Loss (1140)	None.	Affects less than 10% of the member section.	Affects 10% or more of the member but does not warrant structural review.	
Check / Shake (1150)	Surface penetration less than 5% of the member thickness regardless of location.	Penetrates 5% - 50% of the thickness of the member and not in a tension zone.	Penetrates more than 50% of the thickness of the member or more than 5% of the member thickness in a tension zone. Does not warrant structural review.	
Crack (1160)	None.	Crack that has been arrested through effective measures.	Identified crack exists that is not arrested, but does not require structural review.	
Split / Delamination (1170)	None.	Length less than the member depth or arrested with effective actions taken to mitigate.	Length equal to or greater than the member depth, but does not require structural review.	
Abrasion / Wear (1180)	None or no measurable section loss.	Section loss less than 10% of the member thickness	Section loss 10% or more of the member thickness but does not warrant structural review.	
Distortion (1900)	None.	Distortion not requiring mitigation or mitigated distortion.	Distortion that requires mitigation that has not been addressed but does not warrant structural review.	
Settlement (4000)	None.	Exists within tolerable limits or arrested with no observed structural distress.	Exceeds tolerable limits but does not warrant structural review.	
Scour (6000)	None.	Exists within tolerable limits or has been arrested with effective countermeasures.	Exceeds tolerable limits, but is less than the critical limits determined by scour evaluation and does not warrant structural review.	
Damage (Impact Related) (7000)	Not applicable.	The element has impact damage. The damage caused by the impact has been assessed as Condition State 2 based on the material-specific defects description(s); however, Damage is the predominate defect recorded for this location on the element.	The element has impact damage. The damage caused by the impact has been assessed as Condition State 3 based on the material-specific defects description(s); however, Damage is the predominate defect recorded for this location on the element.	

H-14

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Masonry - Condition State Definitions				
Defect	CS 1 - Good	CS 2 - Fair	CS 3 - Poor	CS 4 - Severe
Delamination / Spall / Patched Area (1080)	None.	Delaminated. Spall 1 in. or less deep or 6 in. or less in diameter. Patched area that is sound.	Spall greater than 1 in. deep or greater than 6 in. diameter. Patched area that is unsound or showing distress. Does not warrant structural review.	The condition warrants a structural review to determine the effect on strength or serviceability of the elements or bridge. Or a structural review has been completed and the defects impact strength or serviceability of the elements or bridge. If the condition is the result of impact damage, then damage is the predominant defect recorded for this location on the element.
Efflorescence / Rust Staining (1120)	None.	Surface white without build-up or leaching without rust staining.	Heavy build-up with rust staining.	
Mortar Breakdown (1610)	None.	Cracking or voids in less than 10% of joints.	Cracking or voids in 10% or more of the of joints	
Split / Spall (1620)	None.	Block or stone has split or spalled with no shifting.	Block or stone has split or spalled with shifting but does not warrant a structural review.	
Patched Area (1630)	None.	Sound patch.	Unsound patch.	
Masonry Displacement (1640)	None.	Block or stone has shifted slightly out of alignment.	Block or stone has shifted significantly out of alignment or is missing but does not warrant structural review.	
Distortion (1900)	None.	Distortion not requiring mitigation or mitigated distortion.	Distortion that requires mitigation that has not been addressed but does not warrant structural review.	
Settlement (4000)	None.	Exists within tolerable limits or arrested with no observed structural distress.	Exceeds tolerable limits but does not warrant structural review.	
Scour (6000)	None	Exists within tolerable limits or has been arrested with effective countermeasures.	Exceeds tolerable limits, but is less than the critical limits determined by scour evaluation and does not warrant structural review.	
Damage (Impact Related) (7000)	Not applicable	The element has impact damage. The damage caused by the impact has been assessed as Condition State 2 based on the material-specific defects description(s); however, Damage is the predominate defect recorded for this location on the element.	The element has impact damage. The damage caused by the impact has been assessed as Condition State 3 based on the material-specific defects description(s); however, Damage is the predominate defect recorded for this location on the element.	

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Other Materials - Condition State Definitions					
Defect	CS 1 - Good	CS 2 - Fair	CS 3 - Poor	CS 4 - Severe	
Corrosion (1000)	None.	Freckled Rust. Corrosion of the steel has initiated.	Measurable ($\geq 1/16''$) section loss is evident or pack rust is present but does not warrant structural review.	The condition warrants a structural review to determine the effect on strength or serviceability of the elements or bridge. Or a structural review has been completed and the defects impact strength or serviceability of the elements or bridge. If the condition is the result of impact damage, then damage is the predominant defect recorded for this location on the element.	
Cracking (1010)	None.	Crack that has self-arrested or has been arrested with effective arrest holes, doubling plates, or similar.	Identified crack exists that is not arrested but does not warrant structural review.		
Connection (1020)	Connection is in place and functioning as intended.	Loose fasteners or pack rust without distortion is present but the connection is in place and functioning as intended.	Missing bolts, rivets, broken welds, fasteners or pack rust with distortion but does not warrant a structural review.		
Delamination / Spall / Patched Area (1080)	None.	Delaminated. Spall 1 in. or less deep or 6 in. or less in diameter. Patched area that is sound.	Spall greater than 1 in. deep or greater than 6 in. diameter. Patched area that is unsound or showing distress. Does not warrant structural review.		
Efflorescence / Rust Staining (1120)	None	Surface white without build-up or leaching without rust staining.	Heavy build-up with rust staining.		
Cracking* (1130)	Insignificant cracks or moderate width cracks that have been sealed.	Unsealed moderate width cracks or unsealed moderate pattern (map) cracking.	Wide cracks or heavy pattern (map) cracking.		
Deterioration (1220)	None.	Initiated breakdown or deterioration.	Significant deterioration or breakdown, but does not warrant structural review.		
Distortion (1900)	None.	Distortion not requiring mitigation or mitigated distortion.	Distortion that requires mitigation that has not been addressed but does not warrant structural review.		
Movement (2210)	Free to move.	Minor restriction.	Restricted but not warranting structural review.		
Alignment (2220)	Lateral and vertical alignment is as expected for the temperature conditions.	Tolerable lateral or vertical alignment that is inconsistent with the temperature conditions.	Approaching the limits of lateral or vertical alignment for the bearing but does not warrant a structural review.		
Bulging, Splitting, or Tearing (2230)	None.	Bulging less than 15% of the thickness.	Bulging 15% or more of the thickness. Splitting or tearing. Bearing's surfaces are not parallel. Does not warrant structural review.		
Loss of Bearing Area (2240)	None.	Less than 10%.	10% or more but does not warrant structural review.		
Leakage (2310)	None.	Minimal. Minor dripping through the joint.	Moderate. More than a drip and less than free flow of water.		Free flow of water through the joint.

Other Materials - Condition State Definitions (continued)				
Defect	CS 1 - Good	CS 2 - Fair	CS 3 - Poor	CS 4 - Severe
Seal Adhesion (2320)	Fully adhered	Adhered for more than 50% of the joint height.	Adhered 50% or less of joint height but still some adhesion.	Complete loss of adhesion.
Seal Damage (2330)	None.	Seal abrasion without punctures	Punctured or ripped or partially pulled out.	Punctured completely through, pulled out, or missing.
Seal Cracking (2340)	None.	Surface crack.	Crack that partially penetrates the seal.	Crack that fully penetrates the seal.
Debris Impaction (2350)	No debris to a shallow cover of loose debris may be evident but does not affect the performance of the joint.	Partially filled with hard-packed material but still allowing free movement.	Completely filled and impacts joint movement.	Completely filled and prevents joint movement.
Adjacent Deck or Header (2360)	Sound. No spall, delamination, or unsound patch.	Edge delamination or spall 1 in. or less deep or 6 in. or less in diameter. No exposed rebar. Patched area that is sound.	Spall greater than 1 in. deep or greater than 6 in. diameter. Exposed rebar. Delamination or unsound patched area that makes the joint loose.	Spall, delamination, unsound patched area, or loose joint anchor that prevents the joint from functioning as intended.
Metal Deterioration or Damage (2370)	None.	Freckled rust; metal has no cracks or impact damage. Connection may be loose but functioning as intended.	Section loss, missing or broken fasteners, cracking of the metal, or impact damage but joint still functioning.	Metal cracking, section loss, damage, or connection failure that prevents the joint from functioning as intended.
Settlement (4000)	None.	Exists within tolerable limits or arrested with no observed structural distress.	Exceeds tolerable limits but does not warrant structural review.	The condition warrants a structural review to determine the effect on strength or serviceability of the elements or bridge. Or a structural review has been completed and the defects impact strength or serviceability of the elements or bridge. If the condition is the result of impact damage, then damage is the predominant defect recorded for this location on the element.
Scour (6000)	None	Exists within tolerable limits or has been arrested with effective countermeasures.	Exceeds tolerable limits, but is less than the critical limits determined by scour evaluation and does not warrant structural review.	
Damage (Impact Related) (7000)	Not applicable	The element has impact damage. The specific damage caused by the impact has been captured in condition state 2 under the appropriate material defect entry.	The element has impact damage. The specific damage caused by the impact has been captured in condition state 3 under the appropriate material defect entry.	

**The inspector should use judgement when utilizing the condition state defect definitions, especially for concrete cracking. The crack defect description definitions describe generalized distress, but the inspector should consider width, spacing, location, orientation, and structural or nonstructural nature of the cracking. The inspector should consider exposure and environment when evaluating cracking width.

Other Concrete: In general, cracks less than 0.012 inches can be considered insignificant, cracks ranging from 0.012 to 0.05 inches can be considered moderate, and cracks greater than 0.05 inches can be considered wide.

H-16

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Appendix I

PennDOT Agency Developed Elements

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APPENDIX I
PennDOT AGENCY DEVELOPED ELEMENTS

Element # 853 – MSE Retaining Wall / Wingwall

Description: Mechanically stabilized earth retaining walls and non-monolithic wingwalls where the structure interacts with the soil for support, including materials retaining the embankment, precast concrete panel and their anchorage system.

Classification: ADE – Agency-Developed Element **Units of Measurement:** ft

Quantity Calculation: Sum of the length of the walls as measured along the face of wall.

Condition State Definitions

Defects	Condition States			
	1	2	3	4
	GOOD	FAIR	POOR	SEVERE
Delamination/Spall/ Patched Area* (1080)	None	Delaminated. Spall 1 in. or less deep or 6 in. or less in diameter. Patched area that is sound.	Spall greater than 1 in. deep or greater than 6 in. diameter. Patched area that is unsound or showing distress. Does not warrant structural review.	The condition warrants a structural review to determine the effect on strength or serviceability of the elements or bridge. Or a structural review has been completed and the defects impact strength or serviceability of the elements or bridge. If the condition is the result of impact damage, then damage is the predominant defect recorded for this location on the element.
Exposed Rebar* (1090)	None	Present without measurable section loss.	Present with measurable section loss but does not warrant structural review.	
Efflorescence/Rust Staining* (1120)	None	Surface white without build-up or leaching without rust staining.	Heavy build-up with rust staining.	
Cracking (RC and Other)* (1130)	Insignificant cracks or moderate-width cracks that have been sealed.	Unsealed moderate width cracks or unsealed moderate pattern (map) cracking.	Wide cracks or heavy pattern (map) cracking.	
Abrasion/Wear* (PSC/RC) (1190)	No abrasion or wearing	Abrasion or wearing has exposed coarse aggregate but the aggregate remains secure in the concrete.	Coarse aggregated is loose or has popped out of the concrete matrix due to abrasion or wear.	
Deterioration (Other)* (1220)	None	Initiated breakdown or deterioration.	Significant deterioration or breakdown but does not warrant structural review.	

*Source: Based on information contained in *Manual for Bridge Element Inspection*, 2013, by the American Association of State Highway and Transportation Officials, Washington, D.C.

APPENDIX I
PennDOT AGENCY DEVELOPED ELEMENTS

Distortion* (1900)	None	Distortion not requiring mitigation or mitigated distortion.	Distortion that requires mitigation that has not been addressed but does not warrant structural review.	The condition warrants a structural review to determine the effect on strength or serviceability of the elements or bridge. Or a structural review has been completed and the defects impact strength or serviceability of the elements or bridge. If the condition is the result of impact damage, then damage is the predominant defect recorded for this location on the element.
Settlement* (4000)	None	Exists within tolerable limits or arrested with no observed structural distress.	Exceeds tolerable limits but does not warrant structural review.	
Scour* (6000)	None	Exists within tolerable limits or has been arrested with effective countermeasures.	Exceeds tolerable limits, but is less than the critical limits determined by scour evaluation and does not warrant structural review.	
Damage (Impact Related)* (7000)	Not applicable	The element has impact damage. The damage caused by the impact has been assessed as Condition State 2 based on the material-specific defects description(s); however, Damage is the only defect recorded for this location on the element.	The element has impact damage. The damage caused by the impact has been assessed as Condition State 3 based on the material-specific defects description(s); however, Damage is the only defect recorded for this location on the element.	

Element Commentary

See Appendix H for a complete description of the “height” scale factor.

1220 Deterioration (Other) is reserved for grout pocket and steel anchor or strap related deficiencies observed during the inspection. Use of this defect code is to be supported in the condition notes in iForms, Form E. The user should enter a narrative as applicable.

APPENDIX I
PennDOT AGENCY DEVELOPED ELEMENTS

Element # 857 – Reinforced Concrete Wingwall/ Retaining Wall

Description: Wingwalls that are non-integral with the abutments and retaining walls constructed of reinforced cast-in-place concrete or precast reinforced concrete.

Classification: ADE –Agency-Developed Element **Units of Measurement:** ft

Quantity Calculation: Sum of the length of the walls as measured along the face of wall.

Condition State Definitions

Defects	Condition States			
	1	2	3	4
	GOOD	FAIR	POOR	SEVERE
Delamination/Spall/ Patched Area* (1080)	None	Delaminated. Spall 1 in. or less deep or 6 in. or less in diameter. Patched area that is sound.	Spall greater than 1 in. deep or greater than 6 in. diameter. Patched area that is unsound or showing distress. Does not warrant structural review.	The condition warrants a structural review to determine the effect on strength or serviceability of the elements or bridge. Or a structural review has been completed and the defects impact strength or serviceability of the elements or bridge. If the condition is the result of impact damage, then damage is the predominant defect recorded for this location on the element.
Exposed Rebar* (1090)	None	Present without measurable section loss.	Present with measurable section loss but does not warrant structural review.	
Efflorescence/Rust Staining* (1120)	None	Surface white without build-up or leaching without rust staining.	Heavy build-up with rust staining.	
Cracking (RC and Other)* (1130)	Insignificant cracks or moderate-width cracks that have been sealed.	Unsealed moderate width cracks or unsealed moderate pattern (map) cracking.	Wide cracks or heavy pattern (map) cracking.	
Abrasion/Wear (PSC/RC)* (1190)	No abrasion or wearing	Abrasion or wearing has exposed coarse aggregate but the aggregate remains secure in the concrete.	Coarse aggregated is loose or has popped out of the concrete matrix due to abrasion or wear.	
Deterioration (Other)* (1220)	None	Initiated breakdown or deterioration.	Significant deterioration or breakdown but does not warrant structural review.	

*Source: Based on information contained in *Manual for Bridge Element Inspection*, 2013, by the American Association of State Highway and Transportation Officials, Washington, D.C.

APPENDIX I
PennDOT AGENCY DEVELOPED ELEMENTS

Distortion* (1900)	None	Distortion not requiring mitigation or mitigated distortion.	Distortion that requires mitigation that has not been addressed but does not warrant structural review.	The condition warrants a structural review to determine the effect on strength or serviceability of the elements or bridge. Or a structural review has been completed and the defects impact strength or serviceability of the elements or bridge. If the condition is the result of impact damage, then damage is the predominant defect recorded for this location on the element.
Settlement* (4000)	None	Exists within tolerable limits or arrested with no observed structural distress.	Exceeds tolerable limits but does not warrant structural review.	
Scour* (6000)	None	Exists within tolerable limits or has been arrested with effective countermeasures.	Exceeds tolerable limits, but is less than the critical limits determined by scour evaluation and does not warrant structural review.	
Damage (Impact Related)* (7000)	Not applicable	The element has impact damage. The damage caused by the impact has been assessed as Condition State 2 based on the material-specific defects description(s); however, Damage is the only defect recorded for this location on the element.	The element has impact damage. The damage caused by the impact has been assessed as Condition State 3 based on the material-specific defects description(s); however, Damage is the only defect recorded for this location on the element.	

Element Commentary

See Appendix H for a complete description of the “height” scale factor.

1220 Deterioration (Other) can be used for to the assembly components of precast walls. Use of this defect code is to be supported in the condition notes in *iForms*, Form E. The user should enter a narrative as applicable.

APPENDIX I
PennDOT AGENCY DEVELOPED ELEMENTS

Element # 860 – Other Wingwall/ Retaining Wall

Description: Wingwalls that are non-integral with the abutments, and retaining walls, constructed of any material other than reinforced cast-in-place concrete or proprietary prefabricated concrete components, or MSE Walls and concrete modular retaining walls.

Classification: ADE –Agency-Developed Element **Units of Measurement:** ft

Quantity Calculation: Sum of the length of the walls as measured along the face of wall.

Condition State Definitions

Defects	Condition States			
	1 GOOD	2 FAIR	3 POOR	4 SEVERE
Connection* (1020)	Connection is in place and functioning as intended.	Loose fasteners or pack rust without distortion is present but the connection is in place and functioning as intended.	Missing bolts, rivets, fasteners, broken welds or pack rust with distortion but does not warrant a structural review.	The condition warrants a structural review to determine the effect on strength or serviceability of the elements or bridge. Or a structural review has been completed and the defects impact strength or serviceability of the elements or bridge. If the condition is the result of impact damage, then damage is the predominant defect recorded for this location on the element.
Delamination/Spall/ Patched Area* (1080)	None	Delaminated. Spall 1 in. or less deep or 6 in. or less in diameter. Patched area that is sound.	Spall greater than 1 in. deep or greater than 6 in. diameter. Patched area that is unsound or showing distress. Does not warrant structural review.	
Exposed Rebar* (1090)	None	Present without measurable section loss.	Present with measurable section loss but does not warrant structural review.	
Efflorescence/Rust Staining* (1120)	None	Surface white without build-up or leaching without rust staining.	Heavy build-up with rust staining.	
Cracking (RC and Other)* (1130)	Insignificant cracks or moderate-width cracks that have been sealed.	Unsealed moderate width cracks or unsealed moderate pattern (map) cracking.	Wide cracks or heavy pattern (map) cracking.	
Decay/Section Loss* (1140)	None.	Affects less than 10% of the member section.	Affects 10% or more of the member but does not warrant structural review.	

*Source: Based on information contained in *Manual for Bridge Element Inspection*, 2013, by the American Association of State Highway and Transportation Officials, Washington, D.C.

APPENDIX I
PennDOT AGENCY DEVELOPED ELEMENTS

Check/Shake* (1150)	Surface penetration less than 5% of the member thickness regardless of location.	Penetrates 5% - 50% of the thickness of the member and not in a tension zone.	Penetrates more than 50% of the thickness of the member or more than 5% of the member thickness in a tension zone. Does not warrant a structural review.	The condition warrants a structural review to determine the effect on strength or serviceability of the elements or bridge. Or a structural review has been completed and the defects impact strength or serviceability of the elements or bridge. If the condition is the result of impact damage, then damage is the predominant defect recorded for this location on the element.
Crack (Timber)* (1160)	None.	Crack has been arrested through effective measures.	Identified crack that is not arrested but does not warrant a structural review.	
Split/Delamination* (1170)	None.	Length less than the member depth or arrested with effective actions taken to mitigate.	Length equal to or greater than the member depth but does not warrant a structural review.	
Abrasion/Wear (Timber)* (1180)	None or no measurable section loss.	Section loss less than 10% of the member thickness.	Section loss 10% or more of the member thickness but does not warrant a structural review.	
Abrasion/Wear (PSC/RC)* (1190)	No abrasion or wearing	Abrasion or wearing has exposed coarse aggregate but the aggregate remains secure in the concrete.	Coarse aggregated is loose or has popped out of the concrete matrix due to abrasion or wear.	
Deterioration (Other)* (1220)	None	Initiated breakdown or deterioration.	Significant deterioration or breakdown but does not warrant structural review.	
Mortar Breakdown (Masonry)* (1610)	None	Cracking or voids in less than 10% of the joints.	Cracking or voids in 10% or more of the joints but does not warrant a structural review.	
Split/Spall (Masonry)* (1620)	None	Block or stone has split or spalled with no shifting.	Block or stone has split or spalled with shifting but does not warrant a structural review.	
Patched Area (Masonry)* (1630)	None	Sound patch.	Unsound patch but does not warrant a structural review.	

APPENDIX I
PennDOT AGENCY DEVELOPED ELEMENTS

Masonry Displacement* (1640)	None	Block or stone has shifted slightly out of alignment.	Block or stone has shifted significantly out of alignment or is missing but does not warrant a structural review.	The condition warrants a structural review to determine the effect on strength or serviceability of the elements or bridge. Or a structural review has been completed and the defects impact strength or serviceability of the elements or bridge. If the condition is the result of impact damage, then damage is the predominant defect recorded for this location on the element.
Distortion* (1900)	None	Distortion not requiring mitigation or mitigated distortion.	Distortion that requires mitigation that has not been addressed but does not warrant structural review.	
Settlement* (4000)	None	Exists within tolerable limits or arrested with no observed structural distress.	Exceeds tolerable limits but does not warrant structural review.	
Scour* (6000)	None	Exists within tolerable limits or has been arrested with effective countermeasures.	Exceeds tolerable limits, but is less than the critical limits determined by scour evaluation and does not warrant structural review.	
Damage (Impact Related)* (7000)	Not applicable	The element has impact damage. The damage caused by the impact has been assessed as Condition State 2 based on the material-specific defects description(s); however, Damage is the only defect recorded for this location on the element.	The element has impact damage. The damage caused by the impact has been assessed as Condition State 3 based on the material-specific defects description(s); however, Damage is the only defect recorded for this location on the element.	

Element Commentary

See Appendix H for a complete description of the “height” scale factor.

1220 Deterioration (Other) can be used for to the assembly components of precast walls. Use of this defect code is to be supported in the condition notes in *iForms*, Form E. The user should enter a narrative as applicable.

APPENDIX I
PennDOT AGENCY DEVELOPED ELEMENTS

Element # 861 – Prefabricated Concrete Modular Wall

Description: Wingwalls that are non-integral with the abutments and retaining walls constructed of proprietary prefabricated concrete components, such as concrete modular retaining walls (Reinforced Earth, Doublewal, etc.).

Classification: ADE -Agency-Developed Element **Units of Measurement:** ft

Quantity Calculation: Sum of the length of the walls as measured along the face of wall.

Condition State Definitions

Defects	Condition States			
	1 GOOD	2 FAIR	3 POOR	4 SEVERE
Delamination/Spall/ Patched Area* (1080)	None	Delaminated. Spall 1 in. or less deep or 6 in. or less in diameter. Patched area that is sound.	Spall greater than 1 in. deep or greater than 6 in. diameter. Patched area that is unsound or showing distress. Does not warrant structural review.	The condition warrants a structural review to determine the effect on strength or serviceability of the elements or bridge. Or a structural review has been completed and the defects impact strength or serviceability of the elements or bridge. If the condition is the result of impact damage, then damage is the predominant defect recorded for this location on the element.
Exposed Rebar* (1090)	None	Present without measurable section loss.	Present with measurable section loss but does not warrant structural review.	
Efflorescence/Rust Staining* (1120)	None	Surface white without build-up or leaching without rust staining.	Heavy build-up with rust staining.	
Cracking (RC)* (1130)	Insignificant cracks or moderate-width cracks that have been sealed.	Unsealed moderate width cracks or unsealed moderate pattern (map) cracking.	Wide cracks or heavy pattern (map) cracking.	
Abrasion/Wear (PSC/RC)* (1190)	No abrasion or wearing	Abrasion or wearing has exposed coarse aggregate but the aggregate remains secure in the concrete.	Coarse aggregated is loose or has popped out of the concrete matrix due to abrasion or wear.	
Deterioration (Other)* (1220)	None	Initiated breakdown or deterioration.	Significant deterioration or breakdown but does not warrant structural review.	

*Source: Based on information contained in *Manual for Bridge Element Inspection*, 2013, by the American Association of State Highway and Transportation Officials, Washington, D.C.

**APPENDIX I
PennDOT AGENCY DEVELOPED ELEMENTS**

Distortion* (1900)	None	Distortion not requiring mitigation or mitigated distortion.	Distortion that requires mitigation that has not been addressed but does not warrant structural review.	The condition warrants a structural review to determine the effect on strength or serviceability of the elements or bridge. Or a structural review has been completed and the defects impact strength or serviceability of the elements or bridge. If the condition is the result of impact damage, then damage is the predominant defect recorded for this location on the element.
Settlement* (4000)	None	Exists within tolerable limits or arrested with no observed structural distress.	Exceeds tolerable limits but does not warrant structural review.	
Scour* (6000)	None	Exists within tolerable limits or has been arrested with effective countermeasures.	Exceeds tolerable limits, but is less than the critical limits determined by scour evaluation and does not warrant structural review.	
Damage (Impact Related)* (7000)	Not applicable	The element has impact damage. The damage caused by the impact has been assessed as Condition State 2 based on the material-specific defects description(s); however, Damage is the only defect recorded for this location on the element.	The element has impact damage. The damage caused by the impact has been assessed as Condition State 3 based on the material-specific defects description(s); however, Damage is the only defect recorded for this location on the element.	

Element Commentary

See Appendix H for a complete description of the “height” scale factor.

1220 Deterioration (Other) can be used for to the assembly components of precast walls. Use of this defect code is to be supported in the condition notes in *iForms*, Form E. The user should enter a narrative as applicable.

APPENDIX I
PennDOT AGENCY DEVELOPED ELEMENTS

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Appendix J

Bridge Element Coding Examples

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APPENDIX J

Bridge Element Coding Examples

Preface

Each bridge requiring element-level inspection, as indicated in Publication 238, Bridge Safety Inspection Manual, will be defined by a collection of National Bridge Elements (NBEs) and Bridge Management Elements (BMEs), in accordance with the current AASHTO Manual for Bridge Element Inspection (MBEI). Agency Developed Elements, as indicated in Appendix I of this manual, will also be collected; these elements are specific to Pennsylvania. Each element will be quantified by four Element Condition States in accordance with the MBEI such that 100 percent of the total element quantity is coded in one or more Element Condition States. The Element Condition States provide a general overview of the condition of the element while Defect Code Condition States provide greater detail and identifies specific deterioration of the element. The quantity in each Element Condition State is based on the defect quantities identified and documented by the inspector during an inspection. Defects are recorded using predefined Defect Codes from the MBEI (also shown in Appendix H) and quantified in four Defect Code Condition States. If no defects are recorded for a specific element, the entire quantity is placed in Element CS-1. The Element Condition State quantity must equal the total Defect Code Condition States for a specific condition state, and the total element quantity must equal the sum of the Element Condition State quantities. The coding examples that follow in this appendix provide guidance in the application of Defect Codes for the following three structure types:

J1 - Single Span, Reinforced Concrete Tee Beam on Cast-in-Place, Reinforced Concrete Abutments

J2 - Single Span, Pony Truss on Cast-in-Place, Reinforced Concrete Abutments

J3 - Two-Span, Simple, Steel Multi-Beam on Cast-in-Place, Reinforced Concrete Abutments
(Note: this example includes both Quantity Mode and Percent Mode found in iForms for defect code and condition state quantity summation).

Defect Code Basics

The recording of an observed defect is done by selecting the applicable Defect Code(s) for each NBE, BME, or ADE and associating the observed field condition with one of the three Defect Code Condition States descriptions for that Defect Code. The applicable defect codes that apply to a specific element, are listed in both iForms and BMS2 when a specific element is being modified. It is common for advanced defects to have a distribution across multiple condition states that represent the progression of material deterioration. As an element progresses in its service life, it will eventually exhibit multiple defects each with their own Defect Code Condition States. When this occurs, the inspector must apply judgement to avoid double counting defects and ensure the Defect Code quantity is assigned to the predominant defect. The following section provides general guidelines for selecting defects and assigning condition state quantities based on defect code definition language.

NBE/BME/ADE Defect Code Guidelines:

- The inspector should use guidance from the AASHTO MBEI found in Appendix H. In particular, familiarity with Section 1.5 "How to use the MBEI" is required to complete an element level inspection.
- The first inspection with migrated data will require the inspector to apply defect codes as only migrated elements. By checking the defect code(s) "Applied" box and quantifying Defect Code Condition States, this may re-distribute the Element Condition States of the migrated data. The absence of defect codes will indicate an element-level inspection has not been completed.
- The purpose of collecting and recording Defect Code Condition States is to ensure an accurate assessment and assignment of Element Condition States.

APPENDIX J

Bridge Element Coding Examples

- Defect Code CS-1 is reserved for element units in good condition and will not require the inspector to place a quantity in Defect Code CS-1 as the value for Defect Code CS-1 will always be displayed as "0" in *iForms*.
- For each defect observed on an element, select the predominate Defect Code and record the applicable Defect Code Condition State quantity in *iForms*.
- The total element quantity will default to Element CS-1 if no defect codes are applied.
- When multiple defects overlap within the same element unit and are quantified with different Defect Code Condition States, the more severe defect (e.g. CS-4) is quantified first and recorded in the applicable condition state. This quantity is subtracted from the total element quantity until all applicable defects have been quantified and the sum of the condition state quantities equals the total element quantity.
- To modify the Defect Code Condition State quantities, the applied check box must be checked in *iForms*.
- Editable fields are highlighted in *iForms* when the specific defect code is selected.

BME Protective System Guidelines:

- Protective systems are child elements to other NBE's, BME's, and ADE's. They cannot occur without a parent element (i.e., NBE, BME, ADE).
- Within a protective system, the defect codes are child elements to the protective system.
- The total quantity for a protective system must be entered by the user.
- Quantities for the protective systems are not automatically totaled into the Defect Code Condition State quantities by *iForms* and BMS2.
- Editable fields are highlighted when the specific defect code is selected.

Defect Code Quantification by Percent Guidelines:

- The default defect code quantification mode is quantity. To switch to percent mode, simply click the radio button to the left of the word percent on the defect code screen. Similarly, to switch from percent to quantity, select the desired radio button.
- When working in Quantity Mode, the individual Defect Code Condition State quantities must be entered first and the total quantity is calculated by BMS2/*iForms*. However, when working in Percent Mode, the total Defect Code is editable and the quantity must be entered prior to entering the individual Defect Code Condition State percentages.
- To begin, the user must enter a defect code quantity. To make the quantity field editable for a specific defect code, the "Applied" box must be checked. The sum of all the defect code quantities cannot exceed the total element quantity.
- When entering a percent for Defect Code CS-2, CS-3, or CS-4, the percentage is based upon the total defect code quantity and not the total element quantity. For example, the user enters the total defect code quantity of 10 SF for Defect Code 1080 (Exposed Rebar), and subsequently enters 40% of the 10 SF is in CS-2, and the remaining 60% is in CS-3.
- When the user entered quantity multiplied by the user entered Condition State percentage equals a non-whole number, the system automatically rounds down the percentage so that the corrected percentage times the user entered quantity equals a whole number. Any remaining percentage will default to the CS-1 percentage value. The user must update the percentages in CS-2, CS-3 and/or CS-4 to equal a combined 100%.
- Editable fields are highlighted when the specific defect code is selected.

APPENDIX J

Bridge Element Coding Examples

1 Single Span Reinforced Concrete Tee Beam

1.1 Structure Description

This structure, shown in Figure 1.1-1, is a single span cast-in-place reinforced concrete tee beam bridge with a 30-foot span length. There are a total of six beams. The superstructure supports a 24 foot roadway consisting of two 10 foot lanes with 2 foot shoulders on each side. The out-to-out width of the superstructure is 26 feet. The concrete abutments have 8-foot long integral wingwalls at each end. The deck has a bituminous overlay and the joints above the abutments consist of pourable seals. No bearings are visible. The bridge carries a state route with an ADT of 1,000 vehicles per day over a two-lane roadway.

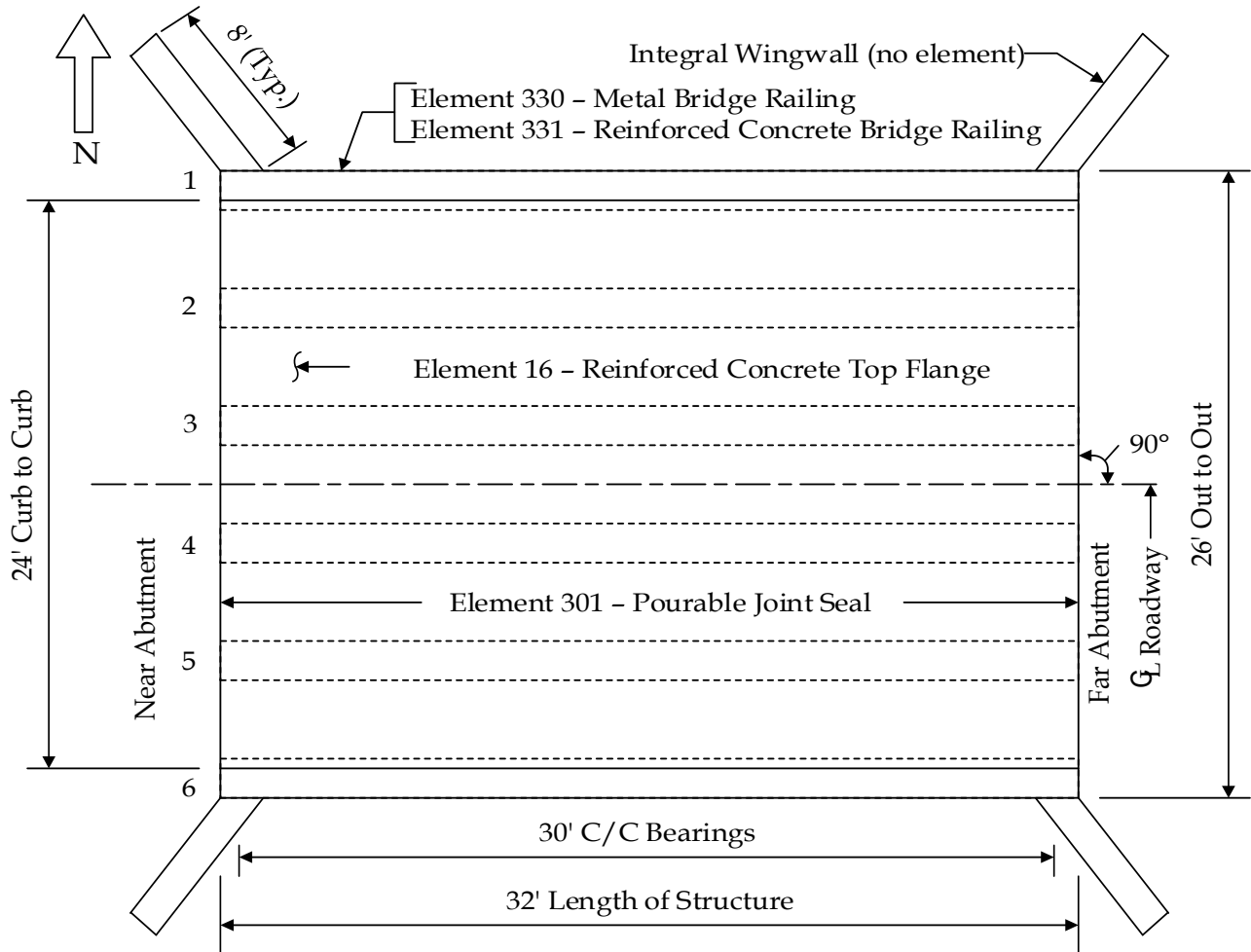


Figure 1.1-1 Plan View of Reinforced Concrete Tee Beam Bridge

APPENDIX J Bridge Element Coding Examples

1.2 Deck Elements and Quantities

The typical section is shown in Figure 1.2-1. The appropriate deck elements and quantity calculations are shown in Table 1.2-1.

Table 1.2-1 Deck Elements and Quantity Calculations

ELEMENT	DESCRIPTION	QUANTITY CALCULATION
16	Reinforced Concrete Top Flange	32' Long x 26' Wide = 832 SF
510	Wearing Surfaces	32' Long x 24' Wide = 768 SF
520	Reinforcing Steel Protective System	32' Long x 26' Wide = 832 SF
301	Pourable Joint Seal	$\frac{26' \text{ Long} \times 2 \text{ Joints}}{\sin(90^\circ)} = 52 \text{ LF}$
330	Metal Bridge Railing	32' Long x 2 Rows = 64 LF
331	Reinforced Concrete Bridge Railing	32' Long x 2 Rows = 64 LF
520	Reinforcing Steel Protective System	32' Long x 6 SF/LF Wide = 192 SF

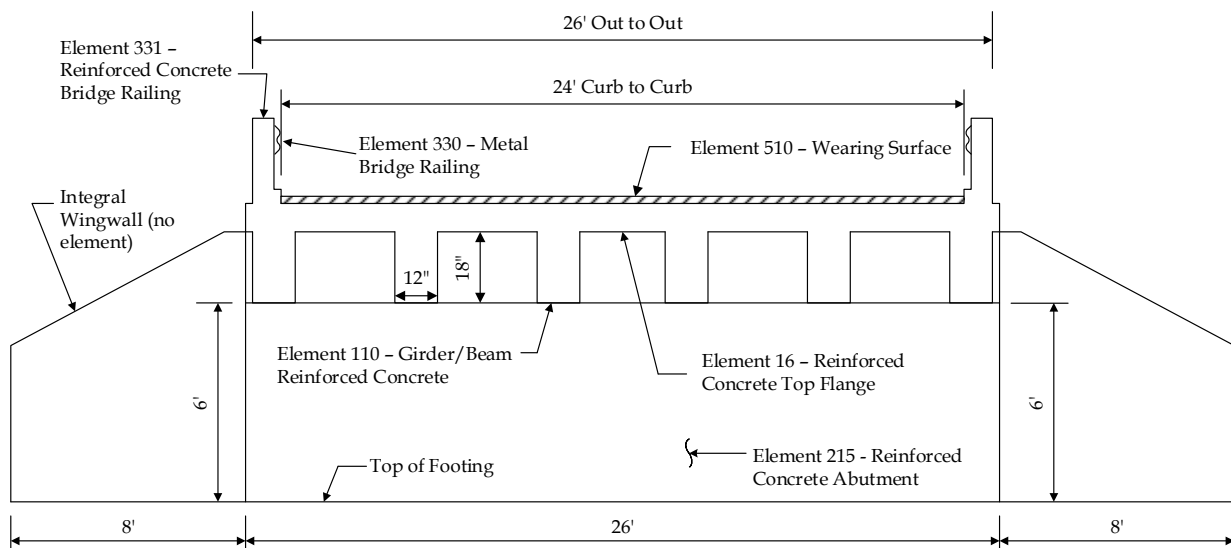


Figure 1.2-1 Typical Tee Beam Section at Abutment

1.3 Superstructure Elements and Quantities

For this example, the superstructure consists of only the beam elements since no bearings are visible. The appropriate element and quantity calculation are shown in Table 1.3-1.

Table 1.3-1 Superstructure Elements and Quantity Calculations

ELEMENT	DESCRIPTION	QUANTITY CALCULATION	SCALE FACTOR
110	Girder/Beam, Reinforced Concrete	30' Long x 6 Beams = 180 FT	$\frac{18'' \text{ Depth}}{12'' \text{ per Foot}} = 1.5 \text{ FT}$
520	Reinforcing Steel Protective System	180 LF x 1.5 LF = 270 SF	N/A

APPENDIX J

Bridge Element Coding Examples

1.4 Substructure Elements and Quantities

The reinforced concrete substructure element in this example includes the abutments and wingwalls. The reinforced concrete wingwall are integral with the abutment. Since the wingwalls are integral with the abutments (no joints) they are included in the abutment element. The appropriate element and quantity calculation are shown in Table 1.4-1.

Table 1.4-1 Substructure Elements and Quantity Calculations

ELEMENT	DESCRIPTION	QUANTITY CALCULATION	SCALE FACTOR
215	Reinforced Concrete Abutment	26' Wide Abutments x 2 Abutments = 52 LF, plus 8' Long Wings x 4 Wings = 32 LF, 52 LF + 32 LF = 84 LF Total	Ht. = 6 LF
520	Reinforcing Steel Protective System	84 LF x 6 LF = 504 SF	N/A

1.5 Environmental States

All elements will be placed in environment 3 (Moderate), as per current policy.

1.6 Inspection Notes

A detailed inspection of the bridge revealed that the bituminous wearing surface exhibited slight wheel rutting over a 24 SF area that included 18 SF of 1/16" map cracking and 6 SF of potholes. The underside of the deck has 200 SF of efflorescence with rust staining. Within that area, there are 75 SF of delaminations with 30 SF of spalls with exposed rebar. The delaminated areas also contain 10 SF of random cracking up to 1/16" wide. A separate area of approximately 300 SF exhibits efflorescence without rust stains. The bridge railing is a combination of concrete and metal. 10 LF of the south concrete railing is severely spalled with 6 LF of exposed reinforcement with rust staining. 15 LF of the right railing, both the metal and concrete portions, has impact damage from a striking vehicle and has caused distortion and spalling in the railings. The remainder of the left rail has random light spalling throughout. Both joints are poured sealant in good condition. The Near Abutment has full-length (not including wingwalls), variable height horizontal cracks and spalling with efflorescence, water leakage and rust staining. The spalls have an average depth of 2 in. There is also an area (7 SF), where the exposed rebar within the spall has 1/16" measurable losses. No scour was noted. The wingwalls are in good condition. The reinforcement used in the top flange (deck), girders, barriers, and abutments were epoxy coated.

Table 1.6-1 Tee Beam Field Conditions

BEAM NO.	CONDITION
1	2" deep spalling over 6 LF at end with 2 LF exposed rebar (1/16" section loss)
2	2 LF x 2' wide spalled at end with exposed rebar (1/16" section loss)
3	6" diameter spall near midspan with exposed stirrup (no section loss)
4	Full-length longitudinal cracks <1/16" (no efflorescence or rust staining)
5	2" deep spalling over 12 LF at end with 4 LF exposed rebar (1/16" section loss)
6	Spalling with exposed reinforcing over 6' at mid-span caused by impact

The conditions of the beams are summarized in Table 1.6-1. Note that Element 16 Reinforced Concrete Top Flange requires an assessment of the top, bottom and fascia portions of the deck element. The recommended method of defect documentation is graphic notation on field sketches.

1.7 Defect Code Condition State Assessment

16 - Reinforced Concrete Top Flange: The 200 SF of efflorescence with rust staining on the top flange

APPENDIX J

Bridge Element Coding Examples

underside is in Condition State (CS)-3. The 300 SF of efflorescence with no rust staining is in CS-2.

Noted Overlapping Defects: 75 SF of delaminations, spalls, and cracking in CS-3 are accounted for in 200 SF of efflorescence/rust staining in CS-3 and will not be counted separately under the condition state quantities. This defect should be noted in the *iForms* condition field.

510 - Wearing Surface (Applied to Element 16): The 18 SF of asphalt cracking is wide enough (1/16") to warrant CS-3 for both the Cracking Defect Code and Effectiveness. The potholes at 6 SF can be considered CS-3 based on their size being larger than 6 inches in diameter and warrant CS-3 for both Pothole Defect Code and Effectiveness.

520 - Concrete Reinforcing Steel Protective System (Applied to Element 16): The underside of the exposed top flanges exhibit efflorescence and rust staining. The assumption is made the rust staining occurs because the epoxy coating on the reinforcing system has limited effectiveness. Both the 200 SF and 300 SF areas of rust staining are in CS-3.

Noted Overlapping Defects: 30 SF of exposed reinforcing are accounted for in 200 SF of efflorescence/rust staining in CS-3 and will not be counted separately under the condition state quantities. This defect should be noted in the *iForms* condition field.

330 - Metal Bridge Railing: The 15 LF of impact damage is considered CS-3 as the railing shape has caused distortion that requires mitigation, however, it does not warrant a structural review. This will be recorded under the Damage defect code.

Noted Overlapping Defects: The 15 LF of distorted metal bridge railing occurs within the impact damage and therefore is not cumulative and will not be counted separately towards the CS quantity. This defect should be noted in the *iForms* condition field.

331 - Reinforced Concrete Bridge Railing: The 10 LF of severely spalled bridge railing will be in CS-3. The remaining length of left railing will be in CS-2 because of the light spalling. The 15 LF of impact damage is considered CS-3 as the concrete railing exhibits heavy map cracking.

Noted Overlapping Defects: The 6 SF of exposed reinforcing with rust staining occurs within the 10 LF of severely spalled bridge railing are therefore not cumulative. Similarly, the 15 LF of heavy map cracking that occurs within the impact damage is not cumulative. Neither overlapping defect will be counted separately towards the CS quantity. These defects should be noted in the *iForms* condition field.

520 - Concrete Reinforcing Steel Protective System (Applied to Element 331): The concrete barrier spall exposes 6 LF of reinforcing. With no width provided, assume the spall exposes a single bar or 1' width. The 6 SF (6 LF x 1 LF) of exposed reinforcing exhibits rust staining and is in CS-3.

110 - Girder / Beam, Reinforced Concrete: Beams 1, 2 and 5 exhibit 20 LF of spalling with 8 LF that have exposed reinforcement in CS-3 (measurable section loss). The entire length of Beam 4 will be in CS-2 because of the full-length cracks < 1/16" wide. The 6 LF of spalling with exposed reinforcing caused by impact damage will be in CS-4 as a structural review was completed and indicated a reduction in capacity of the beam. The remaining lengths of the beams have no recordable defects and will be in CS-1. The 6" diameter spall in Beam #3 is a CS-2.

Noted Overlapping Defects: The 1 LF of exposed rebar in Beam #3, CS-2, is accounted for in the 1 LF of delamination/spall/patched area, CS-2, the 8 LF of exposed rebar, CS-3, is accounted for in the 20 SF of delamination/spall/patched area, CS-3 and the 6 LF of exposed rebar and spalling in CS-4, is accounted for in the 6 LF of damage (impact related); therefore, all areas of exposed rebar and the spalling on Beam 6 are accounted for and will not be counted separately towards the CS quantity. These defects should be noted in the *iForms* condition field.

520 - Concrete Reinforcing Steel Protective System (Applied to Element 110): The exposed reinforcing

APPENDIX J

Bridge Element Coding Examples

along Beams 1, 2, and 6 totals 8 SF and is in CS-4 because of the measurable section losses. The exposed reinforcing along Beam 3 is visible, however, there is no rust staining or measurable losses and is in CS-2.

215 - Reinforced Concrete Abutment: The 26 LF of the Near Abutment with a variable height spall (average 2 LF) with an average depth of 2 in and is coded CS-3. The remaining portions of this abutment and the wingwalls have no noted defects and will be in condition state CS-1.

Noted Overlapping Defects: The 7 LF of exposed rebar with a 1/16" section loss will also be in CS-3, however, it is accounted for in the spalling and will not be counted separately towards the CS quantity. This defect should be noted in the iForms condition field.

520 - Concrete Reinforcing Steel Protective System (Applied to Element 215): The variable height spall along the Near Abutment (52 SF) exhibits exposed reinforcing with rust staining, which is in CS-2. The second spall exposes 7 LF of reinforcing with 1/16" section loss and is in CS-4. The second spall occurs over a width of 1'.

Other Elements: The remaining elements that define the bridge have no defects and are in CS-1. A summary of the elements, condition states, and applicable Defect Codes is provided in Table 1.7-1.

Table 1.7-1 Summary of Element Identification and Assessment

ELEM. NUMBER	DEFECT CODE	ELEMENT / CODE DESCRIPTION	UNIT	TOTAL QTY.	CONDITION STATE QTY.			
					CS-1	CS-2	CS-3	CS-4
16	-	Reinforced Concrete Top Flange	SF	832	332	300	200	0
	1120	<i>Efflorescence / Rust Staining</i>	SF	500	0	300	200	0
510	-	Wearing Surfaces	SF	768	744	0	24	0
	3210	<i>Pothole (Wearing Surface)</i>	SF	6	0	0	6	0
	3220	<i>Crack (Wearing Surface)</i>	SF	18	0	0	18	0
520	-	Reinforcing Steel Protective Systems	SF	832	332	0	500	0
	3600	<i>Effectiveness</i>	SF	500	0	0	500	0
301	-	Pourable Joint Seal	LF	52	52	0	0	0
330	-	Metal Bridge Railing	LF	64	49	0	15	0
	7000	<i>Damage (Impact Related)</i>	LF	15	0	0	15	0
331	-	Reinforced Concrete Bridge Railing	LF	64	17	22	25	0
	1080	<i>Delamination/Spall/Patched Area</i>	LF	32	0	22	10	0
	7000	<i>Damage (Impact Related)</i>	LF	15	0	0	15	0
520	-	Reinforcing Steel Protective Systems	SF	192	186	0	6	0
	3600	<i>Effectiveness</i>	SF	6	0	0	6	0
110	-	Girder / Beam, Reinforced Concrete	LF	180	123	31	20	6
	1080	<i>Delamination/Spall/Patched Area</i>	LF	21	0	1	20	0
	1130	<i>Cracking (RC & Other)</i>	LF	30	0	30	0	0
	7000	<i>Damage (Impact Related)</i>	LF	6	0	0	0	6
520	-	Reinforcing Steel Protective Systems	SF	720	711	1	8	0
	3600	<i>Effectiveness</i>	SF	9	0	1	8	0
215	-	Reinforced Concrete Abutment	LF	84	58	0	26	0
	1080	<i>Delamination/Spall/Patched Area</i>	LF	26	0	0	26	0
520	-	Reinforcing Steel Protective Systems	SF	504	451	0	52	1

APPENDIX J Bridge Element Coding Examples

	3600	Effectiveness	SF	53	0	0	52	1
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BMS2 - iForms Main Container - [Form E]

File DataServices Window Help

SR ID: Status: NAVPAD

Bridge Key: Inspection Date:

Reinforced Concrete Open Girder/Beam

Save Close

Element ID: Structure Unit: Environment: Unit/Measure:

Quantity/Count: Scale Factor: Description:

Condition:

Quantity Percent

CS1 Qty: 123
 CS2 Qty: 31
 CS3 Qty: 20
 CS4 Qty: 6

Defects

Applied	Elem	Description	Qty	SF	UOM	CS1 Qty	CS2 Qty	CS3 Qty	CS4 Qty
<input checked="" type="checkbox"/>	1080	Delamination/Spall/Patched Area	21	1	feet	0	1	20	0
<input type="checkbox"/>	1090	Exposed Rebar	0		feet	0	0	0	0
<input type="checkbox"/>	1120	Efflorescence/Rust Staining	0		feet	0	0	0	0
<input checked="" type="checkbox"/>	1130	Cracking (RC and Other)	30	1	feet	0	30	0	0
<input checked="" type="checkbox"/>	7000	Damage (Impact Related)	6	1	feet	0	0	0	6

Protective Systems

Applied	Elem	Description	Qty	SF	UOM	CS1 Qty	CS2 Qty	CS3 Qty	CS4 Qty
<input checked="" type="checkbox"/>	520	Conc Re Prot Sys	720	1	sq feet	711	1	8	0
<input type="checkbox"/>	521	Conc Prot Coating	0		sq feet	0	0	0	0

Figure 1.7-1 iForms Screen Shot for Elements 110 Reinforced Concrete Open Girder/Beam

APPENDIX J Bridge Element Coding Examples

2 Single Span Painted Steel Truss

2.1 Structure Description

This structure, shown in Figure 2.1-1, is a single span painted steel pony truss with a length of 113'-4". The floor system for the truss consists of nine floor beams spaced at 14'-2" and five rows of stringers spaced at 5'-3". The superstructure supports a 24-foot roadway consisting of two 10-foot lanes with 2-foot shoulders on each side. The centerline distance between trusses is 27 feet. The concrete abutments have 10-foot long non-integral wingwalls at each end. The deck has a bituminous overlay and the joints above the abutments consist of armored compression seals. The bearings at the Near Abutment are fixed, while the bearings at the Far Abutment are movable. The bridge carries a state route with an ADT of 2,500 vehicles per day over a small stream.

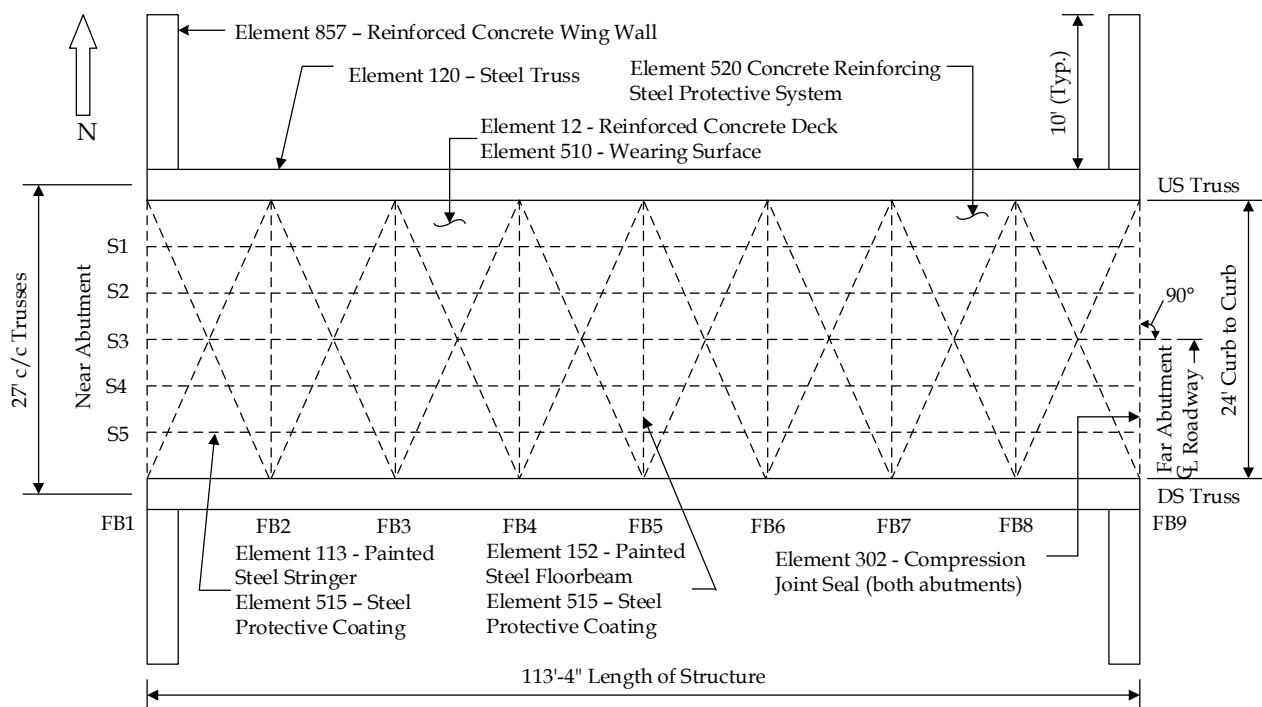


Figure 2.1-1 Plan View of Steel Truss

2.2 Deck Elements and Quantities

The typical section is shown in Figure 2.2-1. The appropriate deck elements and quantity calculations are shown in Table 2.2-1.

Table 2.2-1 Deck Elements and Quantity Calculations

ELEMENT	DESCRIPTION	QUANTITY CALCULATION
12	Reinforced Concrete Deck	113' Long x 25' Wide = 2,825 SF
510	Wearing Surfaces	113' Long x 24' Wide = 2,712 SF
520	Concrete Reinforcing Steel Protective System	113' Long x 25' Wide = 2,825 SF
302	Compression Joint Seal	$\frac{25' \text{ Long} \times 2 \text{ Joints}}{\sin(90^\circ)} = 50 \text{ LF}$
330	Metal Bridge Railing	113' Long x 2 Rows = 226 LF
515	Steel Protective System	226 LF x 4 SF/LF = 904 SF

APPENDIX J Bridge Element Coding Examples

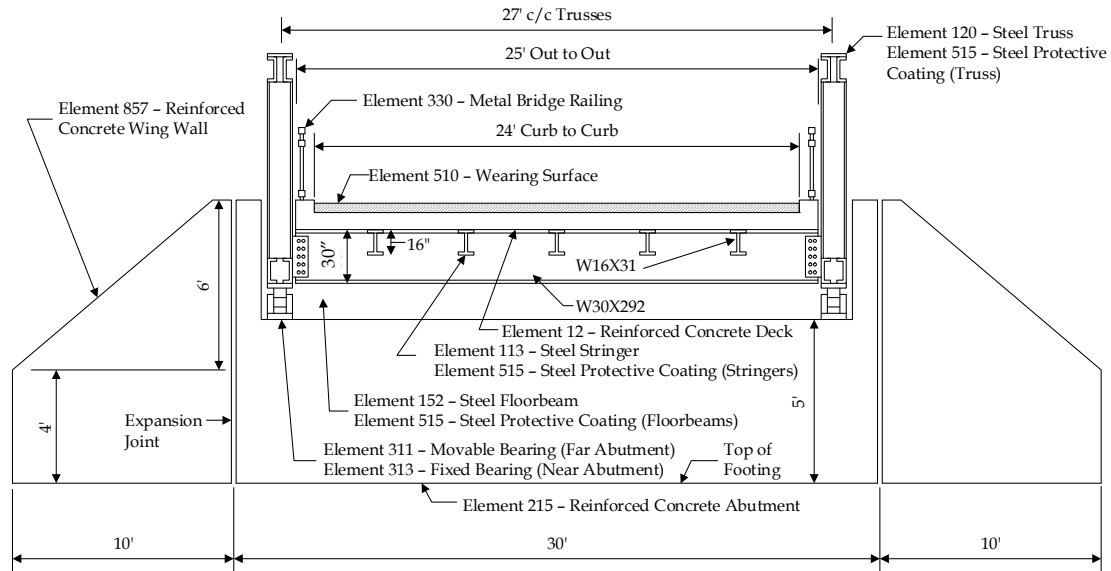


Figure 2.2-1 Typical Truss Section at Abutment

2.3 Superstructure Elements and Quantities

For this example, the superstructure consists of the trusses, floor system, and bearings. The appropriate elements and quantity calculations are shown in Table 2.3-1.

Table 2.3-1 Superstructure Elements and Quantity Calculations

ELEMENT	DESCRIPTION	QUANTITY CALCULATION	SCALE FACTOR
120	Steel Through Truss	113' Long x 2 Trusses = 226 LF	N/A
515	Steel Protective Coating - Truss	22 SF/LF x 226 LF = 4,972 SF	N/A
113	Steel Stringer	113' Long x 5 Rows = 565 LF	$\frac{16" \text{ Depth}}{12" \text{ per Foot}} = 1.33 \text{ FT}$
515	Steel Protective Coating - Stringers	9 SF/LF x 565 LF = 5,085 SF	N/A
152	Steel Floorbeam	25' Long x 9 Floorbeams = 225 LF	$\frac{30" \text{ Depth}}{12" \text{ per Foot}} = 2.5 \text{ FT}$
515	Steel Protective Coating - Floorbeams	5 SF/LF x 225 LF = 1,125 SF	N/A
311	Movable Bearing	1 per Truss x 2 Trusses = 2 EA	N/A
515	Steel Protective Coating - Bearings	2 EA x 2 SF/EA = 4 SF	N/A
313	Fixed Bearing	1 per Truss x 2 Trusses = 2 EA	N/A
515	Steel Protective Coating - Bearings	2 EA x 2 SF/EA = 4 SF	N/A

Note: For protective coating on this truss, use 22 SF/LF of paint, protective coating on stringers, use 9 SF/LF of paint and for protective coating on the floor beams, use 5 SF/LF of paint. For the protective coating on the bearings, use 2 SF/EA of paint. The values listed above are specific to this example; calculations will be required for each bridge.

2.4 Substructure Elements and Quantities

The substructure includes the abutments and wingwalls. Since there are expansion joints between the abutment and wingwalls, they are not included in the abutment element and are tabulated separately. The appropriate elements and quantity calculations are shown in Table 2.4-1.

APPENDIX J

Bridge Element Coding Examples

Table 2.4-1 Substructure Elements and Quantity Calculations

ELEMENT	DESCRIPTION	QUANTITY CALCULATION	SCALE FACTOR
215	Reinforced Concrete Abutment	30' Long x 2 Abutments = 60 LF	Ht. = 5 LF
520	Concrete Reinforcing Protective System	60 LF x 5 LF = 300 SF	N/A
857	Reinforced Concrete Wingwall	10' Long x 4 Wingwalls = 40 LF	Ht. = 7 LF (average height)
520	Concrete Reinforcing Protective System	40 LF x 7 LF = 280 LF	N/A

2.5 Environmental States

All elements will be placed in environment 3 (moderate), as per current policy.

2.6 Inspection Notes

A detailed inspection of the bridge revealed that the bituminous wearing surface was generally in good condition with only minor cracking present over 907 SF. The underside of the deck has 114 SF of heavy map cracking with efflorescence but no rust staining. In a separate area, there is 133 SF of delaminations with 30 SF of 2" deep spalls and exposed reinforcing with minor surface corrosion. The total combined area of underside defects is 247 SF. At the Near Abutment, the joint material is torn for a total of 10 LF and an additional 10 LF contains packed debris. 5 LF of the torn material shows free flow of water through the joint. Similarly, at the Far Abutment, 15 LF contains packed debris and 10 LF of material was torn. All floor beams have 1/16" to 1/4" section loss along the entire length of the top and bottom flanges. All stringers have 1/16" to 3/16" section loss on the top and bottom flanges for a length of 2 feet from the floorbeam connections. The bearings and concrete substructure are in good condition.

The reinforcing bars used in the deck, abutment and wingwalls was epoxy coated.

2.7 Defect Code Condition State Assessment

12 - Reinforced Concrete Deck: The 114 SF of heavy map cracking with efflorescence located on the underside of the deck is in CS-3 and is in CS-2 respectively. The 133 SF of delaminations and spalling along with exposed reinforcement is in CS-3 and CS-2, respectively. Similarly, the exposed rebar is a CS-2 but is already quantified in the 133 SF for spalling under CS-3 and therefore is not recorded.

Noted Overlapping Defects: The 30 SF of exposed rebar in CS-2 is captured in the 200 SF of delamination/spall/patched area in CS-3 and will not be counted in the table. The 114 SF of efflorescence/rust staining in CS-2 will be captured in the 114 SF of cracking in CS-3 and will not be counted separately under the condition state quantities. These defects should be noted in the iForms condition field.

510 - Wearing Surface (Applied to Element 12): 907 SF of hairline asphalt cracking throughout the wearing surface warrants CS-2 for the Cracking Defect Code.

Noted Overlapping Defects: The 907 SF of effectiveness in CS-2 will be accounted for in the 907 SF of crack defect in CS-2 and will not be counted separately under the condition state quantities. These defects should, however, be noted in the iForms condition field.

520 - Concrete Reinforcing Steel Protective System (Applied to Element 12): The 30 SF area where the rebar is exposed, corroded and the epoxy coating is no longer effective is in CS-4. Areas that are cracked with efflorescence but without rust stains indicate the epoxy is still limitedly effective and in CS-3 (284 SF).

APPENDIX J

Bridge Element Coding Examples

The remaining area is hidden within the concrete and is in CS-1.

113 - Steel Stringers: All stringers have 1/16" to 3/16" section loss on the top and bottom flanges for a length of 2 feet from the floorbeam connections section loss, this places 160 LF of steel stringers in CS-3. The remaining lengths of the stringers are devoid of recordable defects and are in CS-1.

152 - Steel Floor Beam: All floor beams have 1/16" to 1/4" section loss along the entire length of the top and bottom flanges, this places all 225 LF of steel floor beams in CS-3.

515 - Steel Protective System (Applied to Elements 113, 120 and 152): For areas where the steel is exposed, corroded and exhibits section loss, all floor beams for their entire length and the end 2 LF of the stringers at the connection, the protective system has completely failed and is no longer effective. Therefore, a CS-4 exists for both effectiveness and peeling/bubbling/cracking defects with a total area of 2,565 SF (1,125 SF + 1,440 SF). 1,135 SF of the protective system along the stringers has peeled and cracked exposing the primer coat and limiting its effectiveness is in CS-3. There is an additional 566 SF along the truss protective coating that exhibits cracking in the finish coat only while still being substantially effective and is in CS-2. The remaining area is good and coded CS-1.

Noted Overlapping Defects: The effectiveness for the steel protective system will not be tabulated in the table because it overlaps with the same area that accounts for the peeling/bubbling/cracking defect. These defects should be noted in the iForms condition field.

302 - Compression Joint seal: 10 LF at the Near Abutment and 15 LF at the Far Abutment contained packed debris and dirt that appeared not to hinder the movement of the joint, putting 25 LF in CS-2. Each joint contained 10 LF of torn joint material with 5 LF at the Near Abutment with severe leakage a total of 15 LF in CS-3 and 5 LF in CS-4 respectively.

Noted Overlapping Defects: Within the 10 LF at the Near Abutment, 5 LF of the joint showed signs of severe leakage that warrants a CS-4 condition. The leakage defect quantity overlaps the seal damage and is not cumulative and will not be recorded separately in the table and the quantity for seal damage will be listed as 5 LF for the Near Abutment. These defects should be noted in the iForms condition field

Other Elements: The remaining elements that define the bridge have no defects and are in CS-1. A summary of the elements, condition states, and applicable Defect Codes is provided in Table 2.7-1.

APPENDIX J
Bridge Element Coding Examples

Table 2.7-1 Summary of Element Identification and Inspection

ELEM. NUMBER	DEFECT CODE	ELEMENT / CODE DESCRIPTION	UNIT	TOTAL QTY.	CONDITION STATE QTY.			
					CS-1	CS-2	CS-3	CS-4
12	-	Reinforced Concrete Deck	SF	2,825	2,578	0	247	0
	1080	<i>Delamination/Spall/Patched Area</i>	SF	133	0	0	133	0
510	-	Wearing Surface	SF	2,712	1,805	907	0	0
	3220	<i>Crack</i>	SF	907	0	907	0	0
	1130	<i>Cracking</i>	SF	114	0	0	114	0
520	-	Concrete Reinforcing Steel Protective System	SF	2,825	2,578	217	0	30
	3600	<i>Effectiveness</i>	SF	277	0	217	0	30
302	-	Compression Joint Seal	LF	50	5	25	15	5
	2310	<i>Leakage</i>	LF	5	0	0	0	5
	2330	<i>Seal Damage</i>	LF	15	0	0	15	0
	2350	<i>Debris Impact</i>	LF	25	0	25	0	0
330	-	Metal Bridge Railing	LF	226	226	0	0	0
515	-	Steel Protective Systems	SF	904	904	0	0	0
113	-	Steel Stringer	LF	565	405	0	160	0
	1000	<i>Corrosion</i>	LF	160	0	0	160	0
515	-	Steel Protective System	SF	4,972	2,397	0	1,135	1,440
	3420	<i>Peeling/Bubbling/Cracking</i>	SF	2,575	0	0	1,135	1,440
120	-	Steel Truss	LF	226	226	0	0	0
515	-	Steel Protective System	SF	5,085	4,519	566	0	0
	3420	<i>Peeling/Bubbling/Cracking</i>	SF	566	0	566	0	0
152	-	Steel Floor Beam	LF	225	0	0	225	0
	1000	<i>Corrosion</i>	LF	225	0	0	225	0
515	-	Steel Protective System	SF	1,125	0	0	0	1,125
	3420	<i>Peeling/Bubbling/Cracking</i>	SF	1,125	0	0	0	1,125
311	-	Movable Bearing	EA	2	2	0	0	0
515	-	Steel Protective System	SF	4	4	0	0	0
313	-	Fixed Bearing	EA	2	2	0	0	0
515	-	Steel Protective System	SF	4	4	0	0	0
215	-	Reinforced Concrete Abutment	LF	60	60	0	0	0
520	-	Concrete Reinforcing Steel Protective System	SF	300	300	0	0	0
857	-	Reinforced Concrete Wingwalls	LF	40	40	0	0	0
520	-	Concrete Reinforcing Steel Protective System	SF	280	280	0	0	0

APPENDIX J

Bridge Element Coding Examples

BMS2 - iForms Main Container - [Form E]
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File DataServices Window Help
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SR ID: **1A09** Status: NAVPAD

Bridge Key: Inspection Date:

Reinforced Concrete Deck

Element ID Structure Unit: Environment: Unit/Measure:

Quantity/Count: Scale Factor: Description:

Condition:

114 SF of Elem. 1120, efflorescence, located on the underside of the deck is a CS-2. 133 SF of Elem. 1090, exposed rebar, is a CS-2. These defects overlap w/defects 1080 and 1130

Quantity Percent

CS1 Qty: 2,578
CS2 Qty: 0
CS3 Qty: 247
CS4 Qty: 0

Defects

Applied	Elem	Description	Qty	SF	UOM	CS1 Qty	CS2 Qty	CS3 Qty	CS4 Qty
<input checked="" type="checkbox"/>	1080	Delamination/Spall/Patched Area	133	1	sq feet	0	0	133	0
<input type="checkbox"/>	1090	Exposed Rebar	0		sq feet	0	0	0	0
<input type="checkbox"/>	1120	Efflorescence/Rust Staining	0		sq feet	0	0	0	0
<input checked="" type="checkbox"/>	1130	Cracking (RC and Other)	114	1	sq feet	0	0	114	0
<input type="checkbox"/>	1190	Abrasion/Wear(PSC/RC)	0		sq feet	0	0	0	0
<input type="checkbox"/>	7000	Damage (Impact Related)	0		sq feet	0	0	0	0

Protective Systems

Applied	Elem	Description	Qty	SF	UOM	CS1 Qty	CS2 Qty	CS3 Qty	CS4 Qty
<input checked="" type="checkbox"/>	510	Wearing Surfaces	2,712	1	sq feet	1,805	907	0	0
<input type="checkbox"/>	3210	Del/Spall/Patch/Pot(Wear Surf)	0		sq feet	0	0	0	0
<input checked="" type="checkbox"/>	3220	Crack (Wearing Surface)	907	1	sq feet	0	907	0	0
<input type="checkbox"/>	3230	Effectiveness (Wearing Surface)	0		sq feet	0	0	0	0
<input type="checkbox"/>	7000	Damage (Impact Related)	0		sq feet	0	0	0	0
<input checked="" type="checkbox"/>	520	Conc Re Prot Sys	2,825	1	sq feet	2,578	217	0	30
<input checked="" type="checkbox"/>	3600	Eff - Protect Sys(e.g. cathodic)	247	1	sq feet	0	217	0	30
<input type="checkbox"/>	7000	Damage (Impact Related)	0		sq feet	0	0	0	0
<input type="checkbox"/>	521	Conc Prot Coating	0		sq feet	0	0	0	0

Figure 2.7-3 iForms Screen Shot for Element 12 Reinforced Concrete Deck

APPENDIX J Bridge Element Coding Examples

3 Two Span Painted Steel Multi-Beam Bridge

3.1 Structure Description

This structure, shown in Figure 3-1, is a painted steel multi-beam bridge with two equal span lengths of 61 feet. There are a total of nine W32X292 beams. The exterior face and bottom flange of the fascia beams are encased in concrete. The superstructure supports a 30-foot roadway consisting of two 10-foot lanes with 5-foot shoulders on each side. The out-to-out width of the bridge is 44 feet, including 6-foot sidewalks and 1-foot railings on each side. The deck was constructed with epoxy coated reinforcement. The concrete abutments have 10-foot long non-integral wingwalls at each end. The deck has a bituminous overlay and all joints are pourable seals. The bearings at the abutments are moveable, while the bearings at the pier are fixed. The bridge carries a state route with an ADT of 6,500 vehicles per day over a small stream.

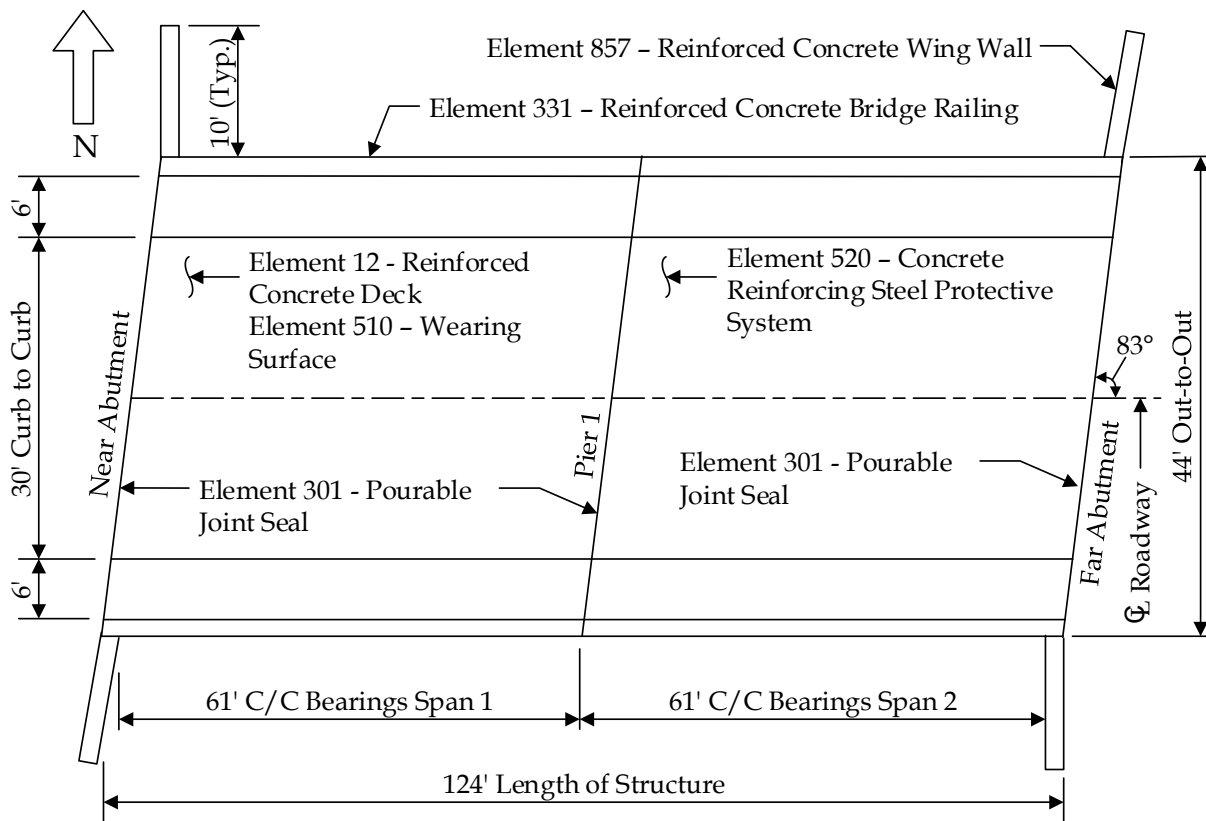


Figure 3.1-1 Plan View of Steel Multi-Beam Bridge

APPENDIX J Bridge Element Coding Examples

3.2 Deck Elements and Quantities

The typical section is shown in Figure 3.2-1. Joint elements at piers should be assigned to the lowest numbered span that they share. The appropriate deck elements and quantity calculations are shown by span in Tables 3.2-1 and 3.2-2.

Table 0-1 Deck Elements and Quantity Calculations - Span 1

ELEMENT	DESCRIPTION	QUANTITY CALCULATION
12	Reinforce Concrete Deck	62' Long x 44' Wide = 2,728 SF
510	Wearing Surface	62' Long x 30' Wide = 1,860 SF
520	Concrete Reinforcing Steel Protective System	62' Long x 44' Wide = 2,728 SF
301	Pourable Joint Seal	$\frac{44' \text{ Long} \times 2 \text{ Joints}}{\sin(83^\circ)} = 89 \text{ LF}$
331	Reinforced Concrete Bridge Railing	62' Long x 2 Rows = 124 LF
520	Concrete Reinforcing Steel Protective System	124 LF x 4.17 SF/LF = 517 SF

Table 0-2 Deck Elements and Quantity Calculations - Span 2

ELEMENT	DESCRIPTION	QUANTITY CALCULATION
12	Reinforce Concrete Deck	62' Long x 44' Wide = 2,728 SF
510	Wearing Surface	62' Long x 30' Wide = 1,860 SF
520	Concrete Reinforcing Steel Protective System	62' Long x 44' Wide = 2,728 SF
301	Pourable Joint Seal	$\frac{44' \text{ Long} \times 1 \text{ Joints}}{\sin(83^\circ)} = 89 \text{ LF}$
331	Reinforced Concrete Bridge Railing	62' Long x 2 Rows = 124 LF
520	Concrete Reinforcing Steel Protective System	124 LF x 4.17 SF/LF = 517 SF

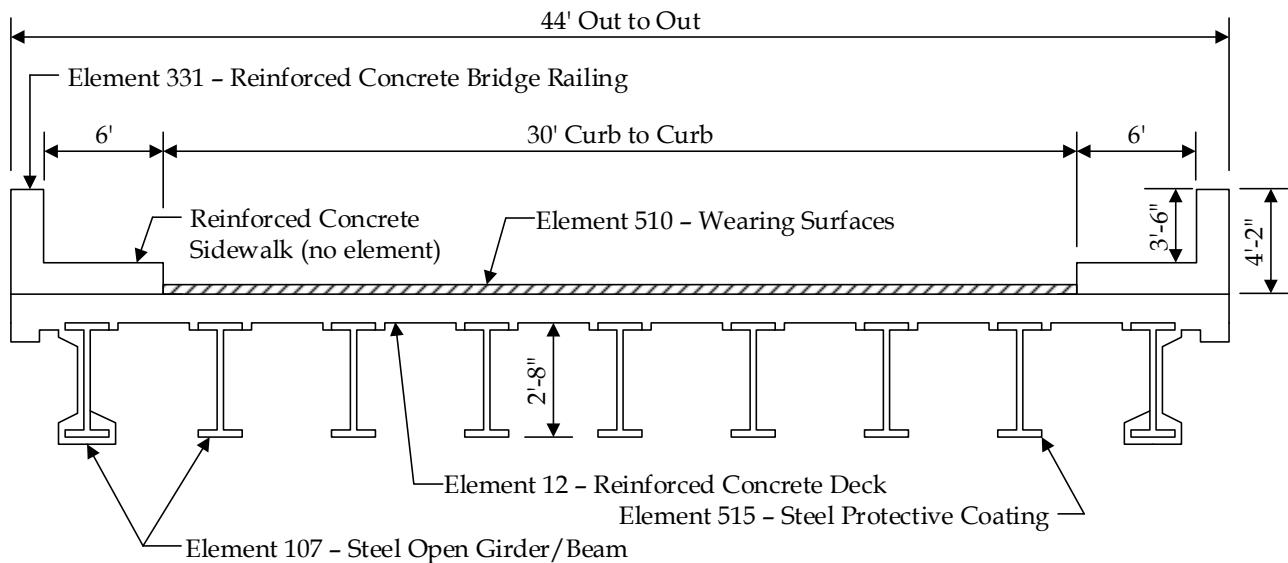


Figure 0-1 Typical Section of Steel Multi-Beam Bridge

APPENDIX J Bridge Element Coding Examples

3.3 Superstructure Elements and Quantities

For this example, the superstructure consists of the steel beams and steel bearings. The appropriate elements and quantity calculations are shown in Tables 3.3-1 and 3.3-2.

Table 3.3-1 Superstructure Elements and Quantity Calculations - Span 1

ELEMENT	DESCRIPTION	QUANTITY CALCULATION	SCALE FACTOR
107	Steel Open Girder/Beam	61' Span x 9 Beams = 549 LF	$\frac{32'' \text{ Depth}}{12'' \text{ per Foot}} = 2.7 \text{ FT}$
515	Steel Protective Coating	61' Span x 7 Beams x 9 SF/LF = 3,843 SF	N/A
311	Movable Bearing	1 per Beam x 9 Beams = 9 EA	N/A
515	Steel Protective Coating	9 EA x 2 SF/EA = 18 SF	N/A
313	Fixed Bearing	1 per Beam x 9 Beams = 9 EA	N/A
515	Steel Protective Coating	9 EA x 2 SF/EA = 18 SF	N/A

Table 3.3-2 Superstructure Elements and Quantity Calculations - Span 2

ELEMENT	DESCRIPTION	QUANTITY CALCULATION	SCALE FACTOR
107	Steel Open Girder/Beam	61' Span x 9 Beams = 549 LF	$\frac{32'' \text{ Depth}}{12'' \text{ per Foot}} = 2.7 \text{ FT}$
515	Steel Protective Coating	61' Span x 7 Beams x 9 SF/LF = 3,843 SF	N/A
311	Movable Bearing	1 per Beam x 9 Beams = 9 EA	N/A
515	Steel Protective Coating	9 EA x 2 SF/EA = 18 SF	N/A

Note: For protective coating on the open steel girders use 9 SF/LF of paint, and use 2 SF/EA of paint for both the movable and fixed bearings. The values listed above are specific to this example. The values listed above are specific to this example; calculations will be required for each bridge.

3.4 Substructure Elements and Quantities

The substructure elements are shown in Figure 3.4-1. The substructure includes the pier, abutments, and wingwalls. Since there are expansion joints between the abutment and wingwalls, they are not included in the abutment element and are tabulated separately. Substructure elements should be assigned to the lowest numbered span that they share. The appropriate elements and quantity calculations are shown in Tables 3.4-1 and 3.4-2.

APPENDIX J Bridge Element Coding Examples

Table 3.4-1 Substructure Elements and Quantity Calculations - Span 1

ELEMENT	DESCRIPTION	QUANTITY CALCULATION	SCALE FACTOR
210	Reinforced Concrete Pier Wall	44' Long x 1 Pier = 44 LF	Ht. = 8.0 LF
215	Reinforced Concrete Abutment	44' Long x 1 Abutment = 44 LF	Ht. = 10.0 LF
234	Reinforced Concrete Pier Cap	45' Long x 1 Pier = 45 LF	Ht. = 2.0 LF
857	Reinforced Concrete Wingwall	10' Long x 2 Wingwalls = 20 LF	Ht. = 10.0 LF (average height)

Table 3.4-2 Substructure Elements and Quantity Calculations - Span 2

ELEMENT	DESCRIPTION	QUANTITY CALCULATION	SCALE FACTOR
215	Reinforced Concrete Abutment	44' Long x 1 Abutment = 44 LF	Ht. = 10.0 LF
857	Reinforced Concrete Wingwall	10' Long x 2 Wingwalls = 20 LF	Ht. = 10.0 LF (average height)

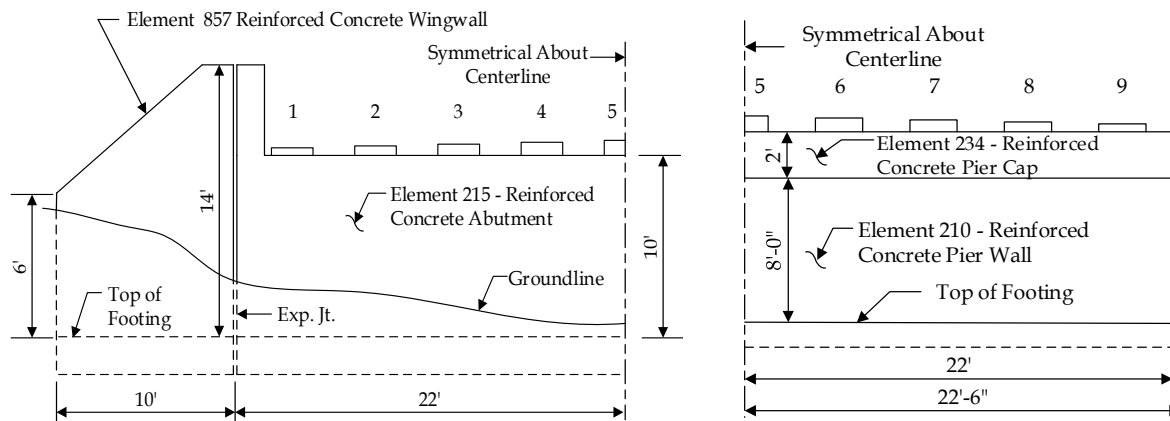


Figure 3.4-1 Half Elevation of Abutment and Pier

3.5 Environmental States

All elements will be placed in environment 3, as per current policy.

3.6 Inspection Notes

A detailed inspection of the bridge revealed that the bituminous wearing surface is generally in fair condition. Spans 1 and 2 have two new 5'-6" wide patches in each span for the full length of the span (62') with each surrounded by areas of light map cracking. The area of cracking is approximately 450 SF in Span 1 and 516 SF in Span 2.

The underside of the deck is covered by stay-in-place forms along the outer two bays with no signs of corrosion. In the exposed portions, Span 1 exhibits 20 SF of spalling with exposed reinforcing while Span 2 exhibits 10 SF. The spalls in both spans are large and are in CS-3. However, the exposed rebar has only surface corrosion and is in CS-2. There is also 10 SF of delaminations in Span 1 and 24 SF of delamination in Span 2, both of which are in CS-2 and independent of the other defect areas.

The beams present some surface rust and section loss. Their condition is summarized in Tables 3.6-1 and 3.6-2 on the following page. All areas along the interior beams without corrosion exhibited chalking paint over the entire length of the beams.

APPENDIX J Bridge Element Coding Examples

Table 3.6-1 Steel Beam Conditions - Span 1

BEAMNO.	CONDITION
1	No defects noted. Concrete encasement is sound
2	Minor section loss on bottom flange and lower 5" of web for full length
3	Minor section loss from 12' to 16' from Near Abutment, heavy rust from 20' to 40' from Near Abutment
4	No defects noted
5	Minor surface rust on both flanges for full length
6	Minor surface rust on web and bottom flange for full length
7	3/32" section loss for a 30' length starting at Near Abutment
8	1/8" section loss for a 50' length starting at Near Abutment
9	No defects noted. Concrete encasement is sound

Table 3.6-2 Steel Beam Conditions - Span 2

BEAMNO.	CONDITION
1	No defects noted. Concrete encasement is sound
2	Minor section loss on bottom flange and lower 5" of web for full length
3	No defects noted
4	No defects noted
5	Minor surface rust on both flanges for full length
6	Minor surface rust on web and bottom flange for full length
7	No defects noted
8	No defects noted
9	No defects noted. Concrete encasement is sound

The Near Abutment has 10 feet of spalling below the bearing seat, 1 ½" deep by 8" high, with exposed reinforcing. The Near Abutment backwall has minor spalling along the joint area over a width of 3 feet. The Far Abutment has spalling below the bearing seat for its full width, 2 ½" deep by 12" high, with exposed reinforcing (no measurable section loss or rust staining). The wall pier has one, 5-foot long, spall below the bearing seat, 2" deep by 1'-2" high, with exposed reinforcing exhibiting rust staining, while the remaining width has 2 spalls, each 1" deep by 5" high by 2'-6" long, with no exposed reinforcing. No defects were noted on the concrete wingwalls. The pier wall has 5 feet of spalling directly below the pier cap, 4" deep by 9" high with exposed reinforcing. The pier wall has 5 feet of delimitations, 3" high, along the ground line. The pier cap has a previously repaired area, 8" x 5' that is unsound directly below the bearing seat. There is also 6' on either side of previously repaired area (12' total), of a shallow ½" deep by 5" high spall. The concrete reinforcing used in the deck, and barrier is epoxy coated. The reinforcing used in the abutment, pier and wingwalls are black bars.

3.7 Defect Code Condition State Assessment

12 - Reinforced Concrete Deck: Span 1 contains 20 SF of spalling with exposed reinforcing while Span 2 contains 10 SF. The spalls in both spans are large and are in CS-3. However, the exposed rebar has only surface corrosion and is in CS-2. There is also 10 SF of delaminations in Span 1 and 24 SF of delamination in Span 2, both of which are in CS-2 and independent of the other defect areas.

Noted Overlapping Defects: The 20 SF and 10 SF of exposed rebar is not counted in the Element Condition State total because it is accounted for in the more severe spalling defect. These defects should be noted in the *i*Forms condition field.

520 - Concrete Reinforcing Steel Protective System (Applied to Element 12): For areas in both spans where

APPENDIX J

Bridge Element Coding Examples

the rebar is exposed and corroded, the epoxy coating is no longer effective and is in CS-4 (20 SF in Span 1, 10 SF in Span 2). Areas that are delaminated indicate the onset of corrosion and limited effectiveness are in CS-3 (10 SF in Span 1, 24 SF in Span 2). The remaining area has no visible defects is coded CS-1.

510 - Wearing Surface (Applied to Element 12): 682 SF of asphalt patching in each span is in CS-2. The light asphalt map cracking around the patching in each span is in CS-2 for the Cracking Defect Code.

Noted Overlapping Defects: The 1,132 SF in Span 1 and 1,198 SF in Span 2 is in CS-2 for the Effectiveness Defect Code will not be calculated in the Element Condition State total because it is accounted for in the more severe patched area and cracking defects. The effectiveness for the wearing surface should be noted in the *iForms* condition field.

107 - Steel Open Girder/Beam: Span 1 Beams collectively have 85 LF of corrosion with minor section loss putting this area is in CS-3. Span 1 Beams also exhibit 80 LF of corrosion with advanced section loss that warrants a structural evaluation and is in CS-4 coding. An additional area in Span 1 exhibits minor surface rust for 122 LF in CS-2. Span 2 Beams collectively have 61 LF of corrosion with minor section loss in CS-3, and 122 LF of surface or freckled rust in CS-2.

515 - Steel Protective Coating - Paint (Applied to Element 107): Using 9 SF/LF, the total quantity for 7 (interior) beams x 61 LF x 2 spans x 9 SF/LF = 7,686 SF. For coating defect quantification, areas with corrosion and any measure of section loss are in CS-4, and areas with the onset of corrosion are in CS-3. The remaining paint system is chalking and is in CS-2.

Noted Overlapping Defects: The 3,843 SF in Span 1 and 3,843 SF in Span 2 is in CS-2 or CS-3 for the Effectiveness Defect Code and will not be calculated in the Element Condition State total because it is accounted for in the more severe chalking or peeling/bubbling/cracking defects. The effectiveness for the steel protective coating should be noted in the *iForms* condition field.

215 - Reinforced Concrete Abutment: At the Near Abutment, 10 LF of large spalling below the bearing seat is in CS-3. Rebar exposure without section loss or rust staining is in CS-2. The Near Abutment also has spalling along the backwall at the expansion joint (3 SF). This is in CS-2 and it does not overlap the spalling in the stem. At the Far Abutment the stem is spalled along the bearing seat for the entire 44 LF width with exposed rebar and is in CS-3.

Noted Overlapping Defects: The 10 LF at the Near Abutment and the 44 LF at the Far Abutment of exposed rebar quantity is not counted in the Element Condition State total because it is accounted for in the more severe spalling defect. These defects should be noted in the *iForms* condition field.

210 - Reinforced Concrete Pier Wall: The pier has 5 LF of deep spalling with exposed reinforcing in CS-3 and 5 LF of minor spalling with no exposed reinforcing in CS-2.

Noted Overlapping Defects: The 5 LF of exposed rebar at the wall pier is not counted in the Element Condition State total because it is accounted for in the more severe spalling defect. These defects should be noted in the *iForms* condition field.

234 - Reinforced Concrete Pier Cap: The pier cap has 6 LF of unsound patched area with no exposed reinforcing in CS-3 and 12 LF of minor spalling with no exposed reinforcing in CS-2.

Other Elements: The remaining elements that define the bridge have no defects and are in CS-1. Unless the sidewalk is part of the deck structure – not cast separately – defects in the sidewalk should not affect the condition station determination of the deck element.

A Summary of the elements, condition states, and applicable Defect Codes for each span is provided in Table 3.7-1 and Table 3.7-2 in the quantity mode, and Table 3.7-3 and Table 3.7-4 in the percent mode.

APPENDIX J
Bridge Element Coding Examples

Table 3.7-1 Summary of Element Identification and Assessment - SPAN 1 (Quantity Mode)

ELEM. NUMBER	DEFECT CODE	ELEMENT / CODE DESCRIPTION	UNIT	TOTAL QTY.	CONDITION STATE QTY.			
					CS-1	CS-2	CS-3	CS-4
12	-	Reinforced Concrete Deck	SF	2,728	2,698	10	20	0
	1080	<i>Delamination/Spall/Patched Area</i>	SF	30	0	10	20	0
510	-	Wearing Surface	SF	1,860	728	1,132	0	0
	3210	<i>Delamination/Spall/Patched Area</i>	SF	682	0	682	0	0
	3220	<i>Crack (Wearing Surface)</i>	SF	450	0	450	0	0
520	-	Concrete Reinforcing Steel Protective System	SF	2,728	2,698	0	10	20
	3600	<i>Effectiveness</i>	SF	30	0	0	10	20
301	-	Pourable Joint Seal	LF	89	89	0	0	0
331	-	Reinforced Concrete Bridge Railing	LF	124	124	0	0	0
520	-	Concrete Reinforcing Steel Protective System	SF	517	517	0	0	0
107	-	Steel Open Girder/Beam	LF	549	262	122	85	80*
	1000	<i>Corrosion</i>	LF	287	0	122	85	80*
515	-	Steel Protective Coating - Paint	SF	3,843	0	1,260	1,098	1,485
	3410	<i>Chalking</i>	SF	1,260	0	1,260	0	0
	3420	<i>Peeling/Bubbling/Cracking</i>	SF	2,583	0	0	1,098	1,485
311	-	Movable Bearing	EA	9	9	0	0	0
515	-	Steel Protective Coating - Paint	SF	18	18	0	0	0
313	-	Fixed Bearing	EA	9	9	0	0	0
515	-	Steel Protective Coating - Paint	SF	18	18	0	0	0
210	-	Reinforced Concrete Pier Wall	LF	44	34	5	5	0
	1080	<i>Delamination/Spall/Patched Area</i>	LF	10	0	5	5	0
215	-	Reinforced Concrete Abutment	LF	44	31	3	10	0
	1080	<i>Delamination/Spall/Patched Area</i>	LF	13	0	3	10	0
234	-	Reinforced Concrete Pier Cap	LF	45	27	12	6	0
	1080	<i>Delamination/Spall/Patched Area</i>	LF	18	0	12	6	0
857	-	Reinforced Concrete Wingwalls	LF	20	20	0	0	0

* For specific defect codes, a structural review is required when a quantity is placed in CS-4. If after the review it is determined the defect code quantity does not have an impact on the structural capacity of the parent element, the quantity shall be moved to CS-3.

APPENDIX J
Bridge Element Coding Examples

Table 3.7-2 Summary of Element Identification and Assessment - SPAN 2 (Quantity Mode)

ELEM. NUMBER	DEFECT CODE	ELEMENT / CODE DESCRIPTION	UNIT	TOTAL QTY.	CONDITION STATE QTY.			
					CS-1	CS-2	CS-3	CS-4
12	-	Reinforced Concrete Deck	SF	2,728	2,694	24	10	0
	1080	<i>Delamination/Spall/Patched Area</i>	<i>SF</i>	34	0	24	10	0
510	-	Wearing Surface	SF	1,860	662	1,198	0	0
	3210	<i>Delamination/Spall/Patched Area</i>	<i>SF</i>	682	0	682	0	0
	3220	<i>Crack (Wearing Surface)</i>	<i>SF</i>	516	0	516	0	0
520	-	Concrete Reinforcing Steel Protective System	SF	2,728	2,694	0	24	10
	3600	<i>Effectiveness</i>	<i>SF</i>	34	0	0	24	10
301	-	Pourable Joint Seal	LF	89	89	0	0	0
331	-	Reinforced Concrete Bridge Railing	LF	124	124	0	0	0
520	-	Concrete Reinforcing Steel Protective System	SF	517	517	0	0	0
107	-	Steel Open Girder/Beam	LF	549	366	122	61	0
	1000	<i>Corrosion</i>	<i>LF</i>	183	0	122	61	0
515	-	Steel Protective Coating - Paint	SF	3,843	0	2,196	1,098	549
	3410	<i>Chalking</i>	<i>SF</i>	2,196	0	2,196	0	0
	3420	<i>Peeling/Bubbling/Cracking</i>	<i>SF</i>	1,647	0	0	1,098	549
311	-	Movable Bearing	EA	9	9	0	0	0
515	-	Steel Protective Coating - Paint	SF	18	18	0	0	0
215	-	Reinforced Concrete Abutment	LF	44	0	0	44	0
	1080	<i>Delamination/Spall/Patched Area</i>	<i>LF</i>	44	0	0	44	0
857	-	Reinforced Concrete Wingwalls	LF	20	20	0	0	0

APPENDIX J
Bridge Element Coding Examples

Table 3.7-3 Summary of Element Identification and Assessment - SPAN 1 (Percent Mode)

ELEM. NUMBER	DEFECT CODE	ELEMENT / CODE DESCRIPTION	UNIT	TOTAL QTY.	CONDITION STATE %			
					CS-1	CS-2	CS-3	CS-4
12	-	Reinforced Concrete Deck	SF	2,728	98.90	0.37	0.73	0.00
	1080	<i>Delamination/Spall/Patched Area</i>	SF	30	0.00	33.33	66.67	0.00
510	-	Wearing Surface	SF	1,860	39.14	60.86	0.00	0.00
	3210	<i>Delamination/Spall/Patched Area</i>	SF	682	0.00	100.00	0.00	0.00
	3220	<i>Crack (Wearing Surface)</i>	SF	450	0.00	100.00	0.00	0.00
520	-	Concrete Reinforcing Steel Protective System	SF	2,728	98.90	0.00	0.37	0.73
	3600	<i>Effectiveness</i>	SF	30	0.00	0.00	33.33	66.67
301	-	Pourable Joint Seal	LF	89	100.00	0.00	0.00	0.00
331	-	Reinforced Concrete Bridge Railing	LF	124	100.00	0.00	0.00	0.00
520	-	Concrete Reinforcing Steel Protective System	SF	517	100.00	0.00	0.00	0.00
107	-	Steel Open Girder / Beam	LF	549	47.72	22.22	15.48	14.57
	1000	<i>Corrosion</i>	LF	287	0.00	42.51	29.62	27.87
515	-	Steel Protective Coating - Paint	SF	3,843	0.00	32.79	28.57	38.64
	3410	<i>Chalking</i>	SF	1,260	0.00	100.00	0.00	0.00
	3420	<i>Peeling/Bubbling/Cracking</i>	SF	2,583	0.00	0.00	42.51	57.49
311	-	Movable Bearing	EA	9	100.00	0.00	0.00	0.00
515	-	Steel Protective Coating - Paint	SF	18	100.00	0.00	0.00	0.00
313	-	Fixed Bearing	EA	9	100.00	0.00	0.00	0.00
515	-	Steel Protective Coating - Paint	SF	18	100.00	0.00	0.00	0.00
210	-	Reinforced Concrete Pier Wall	LF	44	77.27	11.36	11.36	0.00
	1080	<i>Delamination/Spall/Patched Area</i>	LF	10	0.00	50.00	50.00	0.00
215	-	Reinforced Concrete Abutment	LF	44	70.45	6.82	22.73	0.00
	1080	<i>Delamination/Spall/Patched Area</i>	LF	13	0.00	23.08	76.92	0.00
234	-	Reinforced Concrete Pier Cap	LF	45	60.00	26.67	13.33	0.00
	1080	<i>Delamination/Spall/Patched Area</i>	LF	18	0.00	66.67	33.33	0.00
857	-	Reinforced Concrete Wingwalls	LF	20	100.00	0.00	0.00	0.00

Refer to the Defect Code Quantification by Percent Guidelines on Page J-2 of this Appendix for guidance on working in Percent Mode.

APPENDIX J
Bridge Element Coding Examples

Table 3.7-4 Summary of Element Identification and Assessment – SPAN 2 (Percent Mode)

ELEM. NUMBER	DEFECT CODE	ELEMENT / CODE DESCRIPTION	UNIT	TOTAL QTY.	CONDITION STATE %			
					CS-1	CS-2	CS-3	CS-4
12	-	Reinforced Concrete Deck	SF	2,728	98.75	0.88	0.37	0.00
	1080	<i>Delamination/Spall/Patched Area</i>	SF	34	0.00	70.59	29.41	0.00
510	-	Wearing Surface	SF	1,860	35.59	64.41	0.00	0.00
	3210	<i>Delamination/Spall/Patched Area</i>	SF	682	0.00	100.00	0.00	0.00
	3220	<i>Crack (Wearing Surface)</i>	SF	516	0.00	100.00	0.00	0.00
520	-	Concrete Reinforcing Steel Protective System	SF	2,728	98.75	0.00	0.88	0.37
	3600	<i>Effectiveness</i>	SF	34	0.00	0.00	70.59	29.41
301	-	Pourable Joint Seal	LF	89	100.00	0.00	0.00	0.00
331	-	Reinforced Concrete Bridge Railing	LF	124	100.00	0.00	0.00	0.00
520	-	Concrete Reinforcing Steel Protective System	SF	517	100.00	0.00	0.00	0.00
107	-	Steel Open Girder/Beam	LF	549	66.67	22.22	11.11	0.00
	1000	<i>Corrosion</i>	LF	183	0.00	66.67	33.33	0.00
515	-	Steel Protective Coating - Paint	SF	3,843	0.00	57.14	28.57	14.29
	3410	<i>Chalking</i>	SF	2,196	0.00	100.00	0.00	0.00
	3420	<i>Peeling/Bubbling/Cracking</i>	SF	1,647	0.00	0.00	66.67	33.33
311	-	Movable Bearing	EA	9	100.00	0.00	0.00	0.00
515	-	Steel Protective Coating - Paint	SF	18	100.00	0.00	0.00	0.00
215	-	Reinforced Concrete Abutment	LF	44	0.00	0.00	100.00	0.00
	1080	<i>Delamination/Spall/Patched Area</i>	LF	44	0.00	0.00	100.00	0.00
857	-	Reinforced Concrete Wingwalls	LF	20	100.00	0.00	0.00	0.00

Refer to the Defect Code Quantification by Percent Guidelines on Page J-2 of this Appendix for guidance on working in Percent Mode.

APPENDIX J Bridge Element Coding Examples

BMS2 - iForms Main Container - [Form E]

File DataServices Window Help

SR ID: 1A09 Status: NAVPAD

Bridge Key: Inspection Date:

Reinforced Concrete Abutment

Save Close

Element ID: Structure Unit: Environment: Unit/Measure:

Quantity/Count: Scale Factor: Description:

Condition:

Quantity Percent

CS1 Qty: 31
 CS2 Qty: 3
 CS3 Qty: 10
 CS4 Qty: 0

Defects

Applied	Elem	Description	Qty	SF	UOM	CS1 Qty	CS2 Qty	CS3 Qty	CS4 Qty
<input checked="" type="checkbox"/>	1080	Delamination/Spall/Patched Area	13	1	feet	0	3	10	0
<input type="checkbox"/>	1090	Exposed Rebar	0		feet	0	0	0	0
<input type="checkbox"/>	1120	Efflorescence/Rust Staining	0		feet	0	0	0	0
<input type="checkbox"/>	1130	Cracking (RC and Other)	0		feet	0	0	0	0
<input type="checkbox"/>	1190	Abrasion(PSC/RC)	0		feet	0	0	0	0
<input type="checkbox"/>	4000	Settlement	0		feet	0	0	0	0
<input type="checkbox"/>	6000	Scour	0		feet	0	0	0	0
<input type="checkbox"/>	7000	Damage	0		feet	0	0	0	0

Protective Systems

Applied	Elem	Description	Qty	SF	UOM	CS1 Qty	CS2 Qty	CS3 Qty	CS4 Qty
<input checked="" type="checkbox"/>	520	Conc Re Prot Sys	0		sq feet	0	0	0	0
<input type="checkbox"/>	3600	Eff - Protect Sys(e.g. cathodic)	0		sq feet	0	0	0	0
<input type="checkbox"/>	7000	Damage	0		sq feet	0	0	0	0
<input checked="" type="checkbox"/>	521	Conc Prot Coating	0		sq feet	0	0	0	0
<input type="checkbox"/>	3510	Wear (Concrete Protect Coat)	0		sq feet	0	0	0	0
<input type="checkbox"/>	3540	Eff(Concrete Protect Coat)	0		sq feet	0	0	0	0
<input type="checkbox"/>	7000	Damage	0		sq feet	0	0	0	0

Figure 3.7-1 iForms Screen shot for Element 215 Reinforced Concrete Abutment - Span 1 (Quantity Mode)

APPENDIX J Bridge Element Coding Examples

BMS2 - iForms Main Container - [Form E]

File DataServices Window Help

SR ID: 1A09 Status: NAVPAD

Bridge Key: Inspection Date:

Reinforced Concrete Abutment

Save Close

Element ID: Structure Unit: Environment: Unit/Measure:

Quantity/Count: Scale Factor: Description:

Condition:

10 LF at the Near Abutment of defect 1090, exposed rebar is a CS-2. This defect overlaps with defect 1080, delamination/spalls/patches.

Quantity Percent

CS1 Pct: 70.45
 CS2 Pct: 6.82
 CS3 Pct: 22.73
 CS4 Pct: 0.00

Defects

Applied	Elem	Description	Qty	SF	UOM	CS1 Pct	CS2 Pct	CS3 Pct	CS4 Pct
<input checked="" type="checkbox"/>	1080	Delamination/Spall/Patched Area	13	1	feet	0.00	23.08	76.92	0.00
<input type="checkbox"/>	1090	Exposed Rebar	0		feet	0.00	0.00	0.00	0.00
<input type="checkbox"/>	1120	Efflorescence/Rust Staining	0		feet	0.00	0.00	0.00	0.00
<input type="checkbox"/>	1130	Cracking (RC and Other)	0		feet	0.00	0.00	0.00	0.00
<input type="checkbox"/>	1190	Abrasion(PSC/RC)	0		feet	0.00	0.00	0.00	0.00
<input type="checkbox"/>	4000	Settlement	0		feet	0.00	0.00	0.00	0.00
<input type="checkbox"/>	6000	Scour	0		feet	0.00	0.00	0.00	0.00
<input type="checkbox"/>	7000	Damage	0		feet	0.00	0.00	0.00	0.00

Protective Systems

Applied	Elem	Description	Qty	SF	UOM	CS1 Pct	CS2 Pct	CS3 Pct	CS4 Pct
<input checked="" type="checkbox"/>	520	Conc Re Prot Sys	0		sq feet	0.00	0.00	0.00	0.00
<input type="checkbox"/>	3600	Eff - Protect Sys(e.g. cathodic)	0		sq feet	0.00	0.00	0.00	0.00
<input type="checkbox"/>	7000	Damage	0		sq feet	0.00	0.00	0.00	0.00
<input checked="" type="checkbox"/>	521	Conc Prot Coating	0		sq feet	0.00	0.00	0.00	0.00
<input type="checkbox"/>	3510	Wear (Concrete Protect Coat)	0		sq feet	0.00	0.00	0.00	0.00
<input type="checkbox"/>	3540	Eff(Concrete Protect Coat)	0		sq feet	0.00	0.00	0.00	0.00
<input type="checkbox"/>	7000	Damage	0		sq feet	0.00	0.00	0.00	0.00

Figure 3.7-2 iForms Screen shot for Element 215 Reinforced Concrete Abutment – Span 1 (Percent Mode)