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| <p><b>OS-299 (7-08)</b></p>  <p><b>pennsylvania</b><br/>DEPARTMENT OF TRANSPORTATION</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <p><b>TRANSMITTAL LETTER</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <p><b>PUBLICATION:</b><br/>Publication No. 100A<br/>July 2009 Edition</p> |
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| <p><b>SUBJECT:</b></p> <p style="text-align: center;"><b>Bridge Management System 2 (BMS2) Coding Manual,<br/>Publication 100A, July 2009 Edition</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                           |
| <p><b>INFORMATION AND SPECIAL INSTRUCTIONS:</b></p> <p>Effective immediately, this coding manual shall be used by Department personnel, municipal engineers, and consultants whenever applicable and suitable for safety inspection of bridges, culverts, retaining walls, and overhead sign structures.</p> <p>This manual incorporates and deletes Strike-Off Letters regarding the Bridge Management System. The list of incorporated and deleted Strike-Off Letters is included in the manual.</p> <p>This publication is available on the Department's internet Web page, <a href="http://www.dot.state.pa.us">www.dot.state.pa.us</a>.</p> <p>Comments or questions concerning this manual are to be directed to the Bureau of Design's Bridge Quality Assurance Division and may be submitted electronically using the Bridge Standards Problem Report Form available on the Department's internet page.</p> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                           |
| <p><b>CANCEL AND DESTROY THE FOLLOWING:</b></p> <p>Bridge Management System 2 (BMS2) Coding Manual, Publication 100A, July 2007 Edition and its Revisions</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <p><b>ADDITIONAL COPIES ARE AVAILABLE FROM:</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> PennDOT SALES STORE<br/>(717) 787-6746 phone<br/>(717) 787-8779 fax<br/><a href="mailto:ra-penndotsalesstore.state.pa.us">ra-penndotsalesstore.state.pa.us</a></li> <li><input type="checkbox"/> PennDOT website - <a href="http://www.dot.state.pa.us">www.dot.state.pa.us</a><br/><i>Click on Forms, Publications &amp; Maps</i></li> <li><input type="checkbox"/> DGS warehouse (PennDOT employees ONLY)</li> </ul> |                                                                           |
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COMMONWEALTH OF PENNSYLVANIA  
DEPARTMENT OF TRANSPORTATION

BUREAU OF DESIGN

## **BRIDGE MANAGEMENT SYSTEM 2 (BMS2)**

### **CODING MANUAL**

**OFFICE VERSION**



**JULY 2009 EDITION**



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Appendix A - Create New Structures Form

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Appendix E – Crystal Reports Tables for BMS2 Items

Appendix F – D-491 Forms

## **Incorporated Strike-Off-Letters (SOL)**

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

| SOL       | Date       | Description                                                                                     |
|-----------|------------|-------------------------------------------------------------------------------------------------|
| 431-07-06 | 08/20/07   | Bridge Management System 2 (BMS2) Coding Manual<br>Publication 100A, July 2007 Edition          |
| 431-08-13 | 08/01/2008 | Bridge and Structure Safety Inspection QC Reviews and Plans of Action For Critical Deficiencies |

## Definitions

APRAS

## Automated Permit Routing/ Analysis System

BIMS

Bridge Inspection and Management Section. The section of the Bridge Quality Assurance Division of the Bureau of Design responsible for Administrative and technical support of Pennsylvania bridge inspection and BMS2.

BMS2

Bridge Management System 2

# 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 A. (This is generally the direction of inventory). In the absence of offset, stations, or milepoints, determine orientation in accordance with sketches B and C. If the bridge runs west to east, the direction or orientation should be east (sketch B). If the bridge runs south to north, the direction of orientation should be north (sketch C).

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

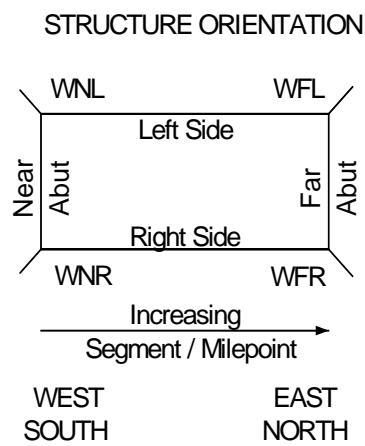
## Federal Highway Administration

# 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.

## **PONTIS**

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.

## **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".

## **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.)

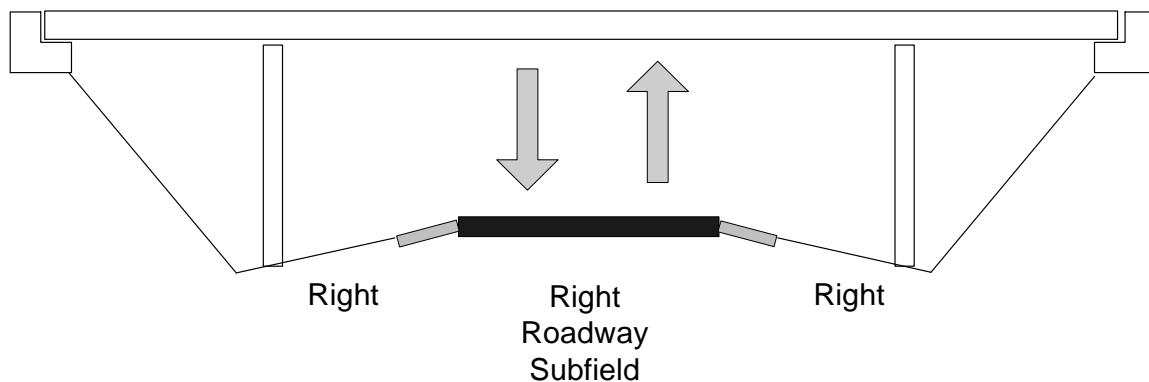
## **Structure Identification**

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

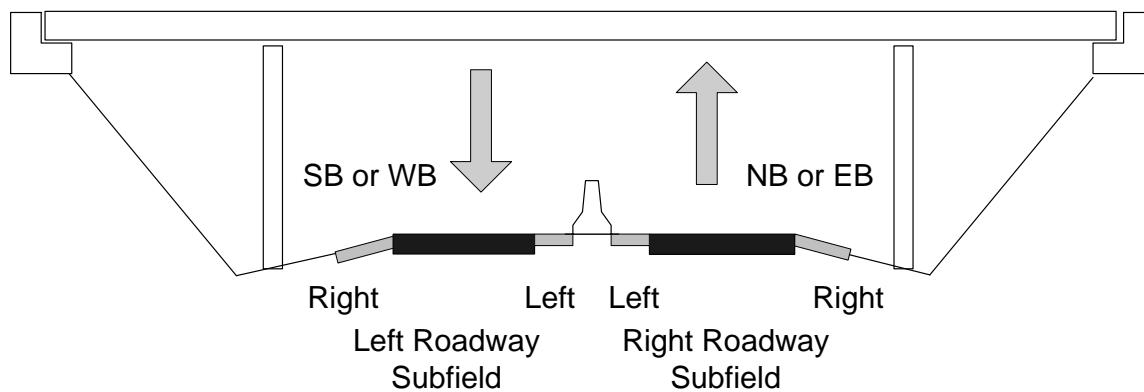
## **User**

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



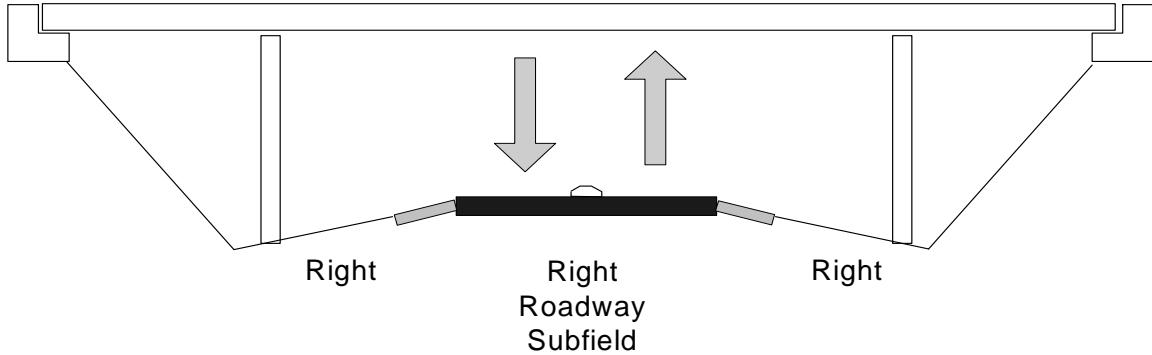
Multi-Directional Highways  
Divided by an Obstruction



Obstructions may include:

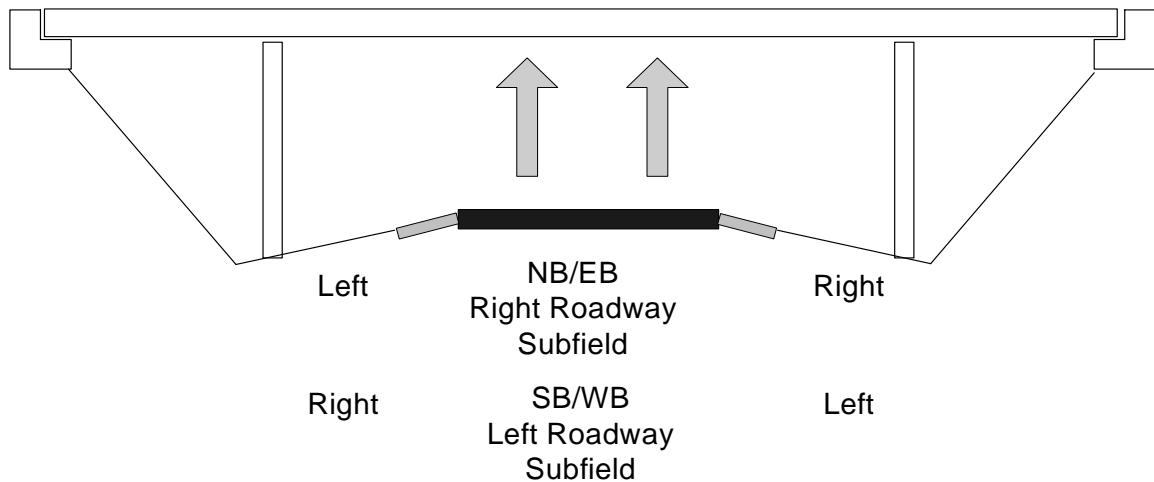
Steel Box Beam, Steel W-Beam, and Concrete  
Shaped Median Barriers, Grass Medians, Non-  
Mountable Medians, and Substructure Units

**Multi-Directional 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**



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# 1.0 INTRODUCTION

## 1.1 Background

The Bridge Management System 2 (BMS2) is the result of a three-phase project over the past five years to replace the original Bridge Management System (BMS). Developed by the Department in 1986, BMS has 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 CoRe element data to the NBI component inspection data. The planning analysis engine that will use this PA CoRe data will be the AASHTOWare Pontis™ bridge management program. The outcome from Pontis™ will help determine the resources needed, on a network basis, to achieve and maintain the desired level of performance for our bridges.

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/Pontis 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 new BMS2 will have 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. For the first time, the web-based portion of BMS2 will allow 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 will allow 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.

Similar to the original, BMS2 will be 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 Bridge Quality Assurance Division of the Bureau of Design 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 three major components:

- a. BMS2 Pontis
- b. BMS2 Web
- c. iForms

BMS2 Pontis is available only to internal PennDOT personnel. It includes all functionality of the BMS2, including:

- View and edit Bridge Inventory and Inspection information
- View and edit Sign Structure, Wall and Other structure inventory and inspection information
- View and edit Bridge Planning and Programming data
- View and edit APRAS bridge data
- Create new structures in BMS2
- View BMS2 Pontis reports

BMS2 Web is available to PennDOT personnel and external Business Partners who have requested access and 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)

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 PA CoRe elements used in BMS2 and instructions coding the inventory of CoRe elements on a bridge, see Publication 590, PA CORE Element Coding Guide.

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 Bridge Quality Assurance Division, Bureau of Design. The phone number is 717-787-3767.

## 1.4 Distribution Procedure

Hardcopy versions of the BMS2 Coding Manual (PennDOT Publication 100A) are available from:

PennDOT Bureau of Design, Bridge Quality Assurance Division,  
P.O. Box 3560 7<sup>th</sup> Floor Keystone Commonwealth Building  
Harrisburg, Pennsylvania, 17120.

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 Design. Proposed changes should be specific and justified. Upon receiving the proposed modification, the Director of the Bureau of Design 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, six “security levels” or user roles are defined to help control access to the Pontis client 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. Alternatively, a bridge inspector may be given additional authority such as the Project User role user role if they are involved in the maintenance planning processes in their local district.

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 Pontis, 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 Pontis based on role. Therefore, a user with the Browser role may access buttons and other controls in Pontis. 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. Within Pontis, this primarily corresponds to the Inspection and Gateway modules. 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 “Approved” status.
- ProjUser -The Project User role provides access to the project planning and programming modules within Pontis. Users authorized with the Project User role also have the ability to use the Gateway module and can access the inspection module, but are not active inspectors (i.e., cannot edit inspection data).

- ProjSuper – The Project Supervisor role builds on the Project User role with additional abilities to modify improvement models and costs, modify improvement policies, and access the preservation modules.
- SuperUser – The Super User role has full authority within BMS2 to perform any action. The Super User role provides update access to the Pontis Configuration module to edit the Pontis parameter tables, including the definition and modification of structure elements. All Pontis functionality is available to the Super User.

See section 4.2 BMS2 Security and Login for security for the different security level in BMS2 Web.

## 2.0 BMS2 Pontis Basics

### 2.1 Logon Procedures

The BMS2 launcher provides a single point of entry into BMS2 for internal PennDOT users. Using the launcher program, users do not invoke Pontis directly - instead, users invoke the launcher program to start Pontis as well as other BMS2 functional components such as Business Objects (Crystal) Enterprise. Only PennDOT internal users connected to the statewide network can invoke Pontis through the launcher. It is assumed that PennDOT users are connected to the statewide network and authenticated using their PennDOT domain credentials prior to invoking the launcher.

1. To access the BMS2 launcher, the user will click on a desktop icon or select it from their program file list.
2. To access Pontis, the user will click on the 'Pontis' button.
3. The Pontis desktop is then displayed.

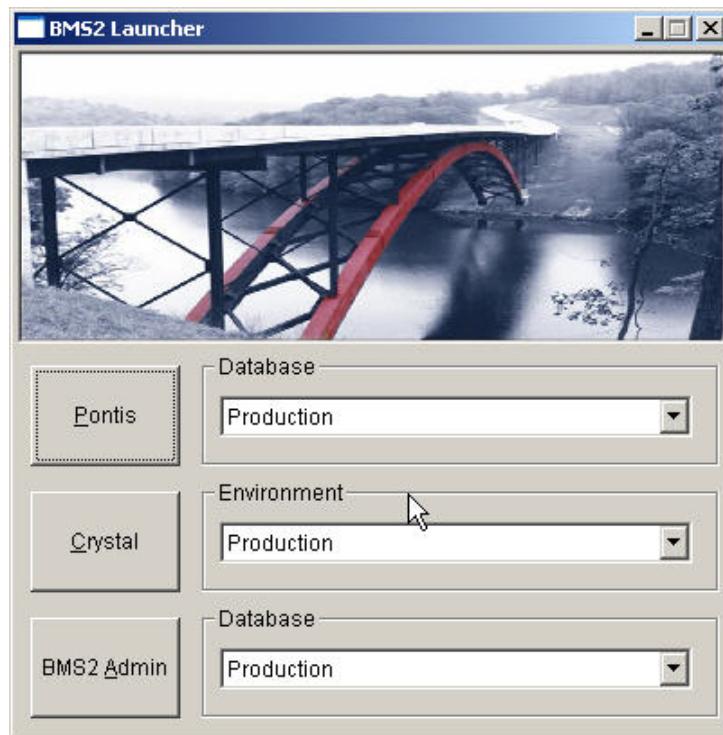


Figure 2.1-1 – BMS2 Launcher Screen

### 2.2 Layouts

Once in Pontis and on the Inspection Desktop screen, the layout function is an effective tool for the user to view a pre-determined list of structures within BMS2. BMS2 has 18 Pontis layouts and 10 layouts created specifically for BMS2. Additional user-defined layouts can be created by submitting a request to BQAD. The following BMS2 specific layouts are available by clicking on the Layout button on the Inspection Desktop window and selecting from the drop down menu:

- **Default Structure Layout** – Default layout contains structures sorted by Bridge ID and includes basic information about each structure.
- **BMS2 Apras Layout** – Layout in which RMS information as well as controlling clearance and rating data is provided about each structure.
- **BMS2 Condition Summary** – Layout that displays condition rating data.
- **BMS2 Layout for Inspections Requiring Review or Approval** – Layout in which structures with inspections requiring review or approval are listed.
- **BMS2 Layout for Maintenance Projects** – Layout showing which activity and cost data are provided.
- **BMS2 Other Structures Layout** – Layout in which non-standard state owned structures and non-State owned structures are listed.
- **BMS2 Requires Posting** – Layout that displays structure posting, open/close status, load limits and posting reason are listed.
- **BMS2 Sign/Light Structure Layout** – Layout containing sign or light structure information, including type, inspection type and date, owner and maintenance responsibility.
- **BMS2 Structure List** – Same as Default Structure Layout.
- **BMS2 Wall Layout** – Layout in which retaining wall information, including type, length, owner, maintenance responsibility and inspection date are listed.

Other useful Pontis Lay-outs include:

- **Bridges with no elements** – Layout in which structures with no elements defined are listed.
- **Bridges with no inspections** – Layout in which structures with no inspection data are listed.
- **Bridges with under roadways** – Same as Default Structure Layout.
- **Condition Summary** – Layout in which condition rating data is provided.
- **Culverts** – Layout in which culverts are listed with basic information about each structure.

Once a layout is on the Inspection Desktop, the user may then sort by any of the columns by clicking on the column heading. The user may sort in ascending or descending order.

### 2.3 Using the Select and Find Buttons

Users can further narrow their search by using the "Select" button from the Inspection Desktop and then apply filters to the layout. The available filters are:

| <u>Item</u> | <u>Description</u>        | <u>Item</u> | <u>Description</u>  |
|-------------|---------------------------|-------------|---------------------|
| 5A04        | District                  | 5A23        | Admin Area          |
| 5A05        | County                    |             | Bridge Group        |
| 5A21        | Owner                     | 7A02        | Inspector           |
| 5C22        | Functional Classification | 7A10        | Inspection Due Date |
| 5C29        | NHS Status                | 5A01        | Structure ID        |

All of the filters may be used together. If none of the filters are selected, Pontis will return all of the structures for the current layout.

Pontis saves the filters until the user changes them. When a new search is to be applied, the user should click on the "Clear Selection" button prior to implementing the selection criteria. By clicking on this button, the user ensures that no previous criteria will be applied to the new search.

**NOTE: If selection criteria are applied and no structures are displayed on the inspection desktop, users must ensure that an appropriate layout is selected. For example, if a user is looking for a bridge in Adams County but they have the "BMS2 Sign/Light Structure Layout" selected as their layout, then the bridge will not appear on the inspection desktop until a different layout is selected. The Default Structure Layout lists all types of structures and will most likely bring up any structure with any selection criteria.**

The "Find" button is similar to the Select feature. It is typically used to find a specific bridge rather than a list of bridges. There are six available search fields for the user to choose from in the Find Structure screen.

| <u>Item</u> | <u>Description</u> | <u>Item</u> | <u>Description</u>  |
|-------------|--------------------|-------------|---------------------|
| 5A01        | Structure ID       | 5A07        | Feature Intersected |
| 5A02        | Structure Name     | 5C06        | Route               |
| 5A08        | Facility Carried   | 5C18        | KM post             |

After the user clicks on "Find Records Based on Current Criteria" a list of bridges should appear. If no bridges appear, then no bridges met any of the criteria. Once the user has found the desired bridge, he/she may double click on the bridge to open up its inspection history.

**IMPORTANT NOTE:** Do not click on the "Open New" button. By doing this, the user will be creating a new inspection record in Pontis. All inspections, except for the inventory inspection, shall be created through iForms.

## 2.4 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 must select the Create Structure Applet which allows users to create a new structure in BMS2. This screen is accessed by selecting the **Create Struct** applet from the desktop. Appendix A provides a list of required fields for be entered for creating a new structure.

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

1. Select the **Create Structure** applet.
2. Complete all fields on each of the three "Required Data" screens.  
Note: The NBI Structure number (5A03) and the Bridge Key (BRKEY) will be automatically generated by BMS2. The Agency Bridge ID (Item 5A01) must be entered by the user in the 14-character SR ID (County/SR/Segment/Offset) format.
3. After entering the required fields, click the "Update When Complete" button.
4. After the structure is created through the applet, the remaining inventory data must be immediately entered via the remaining BMS2 Pontis 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 2.4-1 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 Applet fields.

| Pontis Fields NOT to be Entered by the user                   | Corresponding Agency/Applet 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<br>6C21 - Min. Vertical Clearance for Right Roadway                                                                  |
| 4A17 - Minimum Vertical Underclearance                        | 6C20 - Min. Vertical Clearance for Left Roadway<br>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<br>IR11 - Operating Rating                                                                                                                   |
| 4B13 - TK527 Operating and Inventory Ratings                  | IR10 - Inventory Rating<br>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<br>5B18 - Structure Length                                                                                                    |
| 5C24 - Vertical Clearance over 10 ft Width (Defense Highways) | 6C22 - Vert. Clear. Over 10 ft Width for Left Rdwy<br>6C23 - Vert. Clear. Over 10 ft Width for Right Rdwy                                                            |
| 5C25 - Total Horizontal Clearance                             | 6C18 - Total Horiz. Clearance for Left Roadway<br>6C19 - Total Horiz. Clearance for Right Roadway                                                                    |

**Table 2.4-1 Data fields automatically filled in by BMS2**

5. In order to view and enter information into the PennDOT specific Applet screens (Inventory, PA Inspection, Features Intersected and APRAS Span), click on "Window" and then "Desktop-Inspection" while in one of the Pontis screens for the new bridge. This will take the user to the Inspection Desktop. The user may then select the desired Applet from the drop-down menu.
6. 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 applet.
7. 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 BR KEY number (Item 5A03)**. The RMS coordinator requires the new BR KEY 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 BR KEY 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 BR KEY (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 BR KEY, and therefore the state roadway locations for an existing (demolished) structure cannot automatically be linked to a new (replacement) structure.

8. 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.
9. The BMS Coordinator shall verify the SR ID (Item 5A01) with the RMS Coordinator.
10. After all inventory information has been entered, set the status of the inspection to "4 - Accepted" for item 1A09 on the Inspection Condition 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.

## 2.5 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 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 removing the existing structure from BMS2. 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 2.4. 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 - ID/Admin screen, change the 5A17 (Type Service On) field to "X" (Demolished/Replaced) and change the 5A21 (Owner) field to "XX" (PennDOT Owned, Demolished/Replaced). Save changes.
4. On the Inventory applet - Posting screen, create a new Posting entry for the structure and set the VP02 (Posting Status) to "X" (Demolished/Replaced). Save changes.
5. On the Agency - Bridge screen, check the box for item 6A12 (Dem/Repl Ind).
6. When the new structure is opened to traffic, create a new Posting entry on the Inventory applet - 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 - 5 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.

In the future an automated, overnight batch cycle will be developed to remove and archive the old bridge records. The record will still exist and be available to query but it will not be available to view on the BMS2 desktop.

## 2.6 Maintenance Items and Projects

This section summarizes the Department's procedures for managing maintenance items and projects in BMS2. Focus will be on the Maintenance Applet screen, the Project Planning module and the Agency Project screen.

### 2.6.1 Old BMS AH (Proposed Maintenance), AN (Completed Maintenance) and AG (Repair and Painting) Screens

All proposed maintenance items from the old BMS AH screen were converted as Flexible Actions into BMS2 and stored in the Maintenance Applet screen, Proposed work tab. Flexible actions are PennDOT's current maintenance activities and are based on recommendations from field inspectors.

Completed bridge maintenance items recorded on the old BMS AN screen have been transferred to the Maintenance Applet screen, Complete Work tab in BMS2.

In order to retain historical data on previously completed bridge repair work recorded on the old BMS AG screen in BMS2, all completed repair work was transferred to a project named for that bridge with a prefix of "AG". For example, bridge 66-0066-0060-0000 that had completed repair work entered on the old BMS AG screen has a project name of "AG66-0066-0060-0000".

A program was created to store the completed repair work information. The program name for completed work items is "Old BMS AG screen".

### 2.6.2 Sending Proposed Bridge Maintenance Activities to SAP

All proposed work items (bridge, element and flexible actions) will be listed on the Maintenance Applet, Proposed work tab. The Maintenance Applet 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 Maintenance Applet 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.
8. After the button is pressed, the maintenance activity will appear in SAP as a notification the next day. Further information and approval is necessary within SAP to develop a work order.

Only planned 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.

### **2.6.3 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 IM9) 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 tab. 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.

### **2.6.4 Pontis Project Planning Module**

The Project Planning module provides a flexible set of tools for planning and scheduling project work. The Project Planning module can be used to track the status of projects throughout planning and implementation phases. When projects are completed, the actual work done and costs can be recorded to maintain a convenient history of work for each structure. This information can be used to provide improved cost estimates for future planning, and to track the effectiveness of different types of work over time.

#### **2.6.4.1 Programs**

Programs group and track projects based on characteristics such as time frame (e.g. fiscal year), type of work, status, etc.

Central Office will be responsible for creating programs for the Districts to store their projects. For example, Districts must create projects for maintenance work in fiscal year 2006/2007 and store them under the "FY06/07 Maintenance" program.

For the time being, only Central Office will be creating programs until further direction is given to the Districts. If Districts would like to have a specific program created, they should notify Central Office.

Table 2.6.4.1-1 lists the programs currently in BMS2.

| Program ID             | Program Name                    | Description                                                                                 |
|------------------------|---------------------------------|---------------------------------------------------------------------------------------------|
| BMS Compl Repair       | BMS Completed Repair/Painting   | Records projects that contain repair items from Old BMS AG screen                           |
| FY 06/07 Maintenance   | County Maintenance for FY 06/07 | Stores projects that have BMS2 maintenance items completed or will be completed in FY 06/07 |
| FY 07/08 Maintenance   | County Maintenance for FY 07/08 | Stores projects that have BMS2 maintenance items completed or will be completed in FY 07/08 |
| Existing MPMS Projects | Existing MPMS Projects          | Stores projects referenced in MPMS                                                          |
| Maint 2000 - 2001      | Maintenance FY 2000 - 2001      | Default Pontis Program – <b>Not to be used</b>                                              |

**Table 2.6.4.1-1 Current Programs in BMS2**

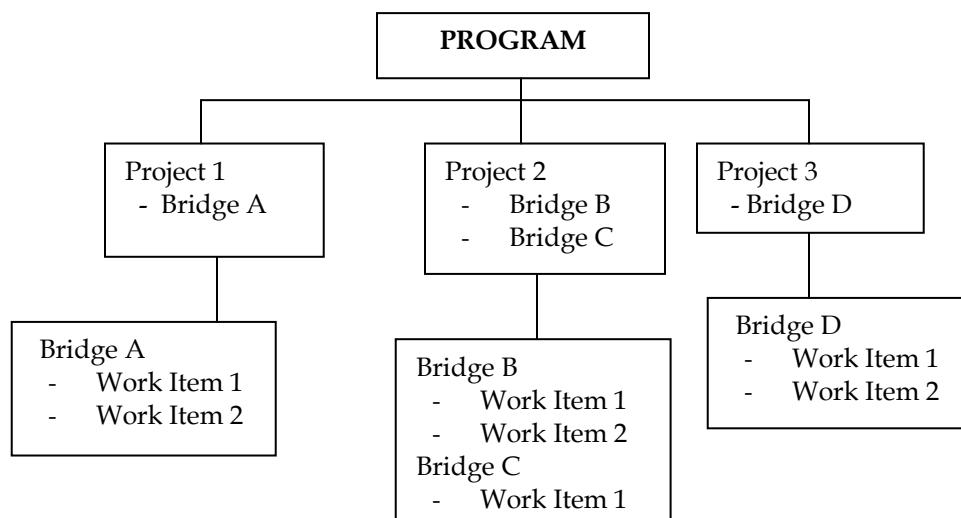
#### 2.6.4.2 Projects

A Project is a set of work items with a schedule and a cost. A project can consist of work items on one or more bridges. A project can include many work items. As a rule, work that is to be programmed or scheduled as a unit, and covered by a single contract is typically grouped into a single project.

#### 2.6.4.3 Work Items

A work item is a suggested preservation or improvement action to be taken on a single structure. There are three different types of work candidates: bridge, element and flexible action. Bridge work candidates recommend structure replacement or improvement actions. Element work candidates recommend a preservation action on a particular element. Element work candidates will be generated only by Pontis when a scenario is run in the Programming module. Each Pontis-generated candidate is associated with a particular scenario. Flexible work candidates are established by PennDOT. Flexible work candidates are PennDOT's current maintenance activities and are based on recommendations from field inspectors.

Figure 2.6.4.3-1 shows a flowchart for programs, projects and work items.



**Figure 2.6.4.3-1 – Hierarchy of programs, projects and bridge maintenance items**

### 2.6.5 Existing MPMS projects on the old BMS AO screen

Projects that were identified on the AO screen have been transferred to BMS2. These projects have been stored in the program labeled "MPMS Projects". Most of the information stored on the old BMS AO screen is located on the new BMS2 AP screen. Refer to the new BMS2 coding manual for AP field descriptions.

### 2.6.6 Finding Existing Projects in BMS2

To locate a specific bridge in the Project Planning desktop and find all of associated projects for that bridge, follow these steps:

1. Select the "Bridges" radio button.
2. Click on the "Select" tab. When this opens up, click on the "Clear Selection" button. Within the selection screen, at the bottom under "Bridges", uncheck the "all" box and type in the Bridge SRID (without hyphens). Then Click "OK".
3. Once the bridge is on the desktop, click on the "Sync Lists" button on the left side of the screen. This function will find all projects associated with the bridge(s) and list them on the Project Planning Desktop.
4. Open the desired project by clicking on the project line.

### 2.6.7 Creating New Projects in BMS2

Projects will need to be created in BMS2 for one of the two instances: (1) To capture completed maintenance items/feasible actions that have an effect on Pontis models or (2) To create and store information on a new proposed project and to interface with MPMS. All new projects to be stored in MPMS shall be stored under the "MPMS Projects" Program in BMS2. Creating projects is not necessary for recording completed maintenance items (see section 2.6.4).

In order to create projects, Districts shall use the following procedure:

1. Click on the Project Planning Module from the Inspection desktop.
2. When the Project Planning desktop appears, click on the Bridges radio button on the upper left portion of the screen
3. Ensure that the desktop view is in the "three panels" view (the radio button is on the left side of the screen).
4. Select the bridge(s) that will be included in the project. Use the "Select" or "Find" buttons at the top of the screen to find the desired bridge, or scroll down to the desired bridge.
5. In the bottom right screen, click on the tab that says "2 Work Candidate"
6. In the same screen, click on the "Select" tab. When this opens up, click on the "Clear Selection" button (this will clear all selection criteria that may have been pre-defined). Within the selection screen, at the bottom under "Bridges", uncheck the "all" box and type in the Bridge SRID (without hyphens). Then Click "OK". If the selection criteria is cleared, but the user doesn't type in the SRID, Pontis will bring in ALL maintenance items for ALL bridges statewide.
7. The lower right screen should now show the all proposed maintenance items only for that bridge.
8. Work items to be included in a project must an "un-assigned status".
9. Click the un-assigned work items that are to be included in this project. Only click once so that each item is highlighted.
10. After highlighting each item that you want to be included under this project, click on the "Create Projects" button. The Create Projects screen will appear.
11. Under "Which Work Items?" at the top left, click on the "Just Selected Work Items" radio button.
12. Select the applicable District Program.
13. For Project Status, Select "0 - proposed" if this is a new project not yet started.
14. For Scenario Treatment, select "Ignore".
15. Enter any specific notes about the project as you wish.
16. Enter the primary funding source (optional)
17. Select year for the project to be completed.
18. Enter the Project ID.

- ii. Completed maintenance items - If creating more than one project for the same bridge, enter numbered suffix at the end of the SR ID. For example, if creating the third project for bridge 66-0066-0060-0000, the project ID should be 66006600600000-03.
  - iii. MPMS Projects – Enter the MPMS Project number for the Project ID
19. Under "Number of Projects to Create" section, there are three options. You may choose whether to create one project (option 1), one project for each structure (option 2), or one project for each work item (option 3). In other words, when work candidates come from multiple bridges you may create one project to encompass all items coming from multiple bridges (option 1), or you may create multiple projects, one project corresponds to each structure (option 2), or you may create multiple projects, one project corresponding to each work item (option 3). For MPMS projects select Option 1.
20. After the above information has been entered, click the "Apply Specifications" button. Information about the project will appear for review. Edit any of this information as needed.
21. Click the "Create Projects" button to create the project. Click "OK" and then "Close".

For projects that will be captured in MPMS, users must also do the following steps to ensure that the two systems communicate.

- 22. Open the project that was just created by double clicking on the project from the Project Planning desktop.
- 23. Select the "Agency" tab.
- 24. Enter the MPMS Project number in field AP01 and select M-MPMS for item AP06, Work Designated For. By completing these two fields the user has created the link between MPMS and BMS2.
- 25. Enter applicable values for all enterable fields on the Agency Project screen. Refer to pages 3-181 to 3-196 for instructions.

### 2.6.8 Marking Projects Completed

To mark projects as completed, users must do the following:

1. Select the Project Plan module from the Inspection desktop.
2. Click on the Projects radio button located on the left side menu. Notice all the projects appear on the project pane
3. To select a project to edit, scroll the project pane or use Pontis to do the searching by clicking on the Select or Find button on the tool menu to find the project.
4. The project should appear on the Project List. Left click on a project ID located in the project list pane to bring up the project data.
5. This window consists of four tab cards: Overview, Work Items, Contract & Funding, and Agency. Select the Overview tab.
6. In the Overview tab, update the Status to "5 – Completed" and enter the Date Completed.
7. If the cost of the project is known, enter the Final Cost

## 2.7 BMS2 Reporting

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

### 2.7.1 Crystal Reports

The primary form of reporting BMS2 data will continue to be 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 ePortfolio web server to enable others to view them without re-creating the report definition and without installing Crystal Reports on their local workstation.

The Bridge QA Division is responsible for authorizing user access to BMS2 and BMS2 data through the PENNDOT ePortfolio web server. Users requesting access to BMS2 and BMS2 data through the PENNDOT ePortfolio web server must complete a "Request for BMS2/APRAS Access" and submit to the BMS2 manager in BQAD. A user may have READER or PUBLISHER access.

A READER is a user who can access published reports on the PENNDOT ePortfolio 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 ePortfolio 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 ePortfolio 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. The following reports are a sample of what's available to users.

- **BP001 Business Plan Bridge Background Data** – This report provides state business plan bridge background data.
- **BP001L Business Plan Bridge Background Data for Local Bridges** – This report provides business plan background data for local bridges.
- **BP002 Business Plan Bridge Background Data by County** – This report provides state business plan bridge background data.
- **CLR001 Bridge Clearance Summary** – This report provides a list with bridge clearance values for those structures where envelope data exists.
- **CLR002 Bridge Vertical Clearance Less Than or Equal to Standard** – This report provides a list of bridges with vertical clearances less than or equal to the user-entered vertical clearance limit.
- **CP001 Closed or Posted Highway Bridges by Length** – This report provides a list of all closed or posted highway bridges by length.
- **CP002 Summary of Closed or Posted Highway Bridges** – This report provides a list of all closed or posted highway bridges by ownership and length.
- **INSP001 Inspection Scheduling Information** – This report provides inspection scheduling information (the last date, frequency, and the next date of inspection) for structures that are scheduled to be inspected with a specified date range.
- **INSP003 Late Inspection Summary Report by Months Late and Agency Submitted** – This report summarizes highway bridges that have not been inspected within the specified time interval (typically 24 months), broken out by the amount of time they are late and by agency submitted.
- **INSP004 Late Inspection Summary Report by Agency Submitted** – This report summarizes the highway bridges that have not been inspected within the specified time interval (typically 24 months), broken out by agency submitted.
- **Local Bridges** – This report lists all local bridges and sorts them by owner.
- **Structurally Deficient and Functionally Obsolete Bridges** – This report displays all the bridges that are defined as either structurally deficient (SD) or functionally obsolete (FO).

## 2.7.2 BMS2 Reports

The Pontis software has prepared reports that are available to the user. Many of these existing Pontis reports will not be of use to the Department since they report on element information. However, as element inspection data is collected and entered some reports will be valuable. To access the Pontis reports in BMS2 click on the **Reports** tab

on the left side of the desktop screen or at the top right of any of the structure data screens in BMS2. A text box will appear with the following options:

- Run S, I & A Inspection Sheet
- Run Tabcard Inspection Report
- View User Reports
- View Inspection Results
- Close

Select the "View Inspection Results" to see a list of available reports. Refer to the Pontis User Manual for further description of these standard reports.

Pontis also allows an agency to create and store their own specific reports under "View User Reports" to meet their needs. PennDOT developed new D-491 reports and stored them in the User Reports section. All D-491 reports have the name format of **d\_d-491\_XX\_(Screen name)**, where XX is the alpha-numeric screen ID. Most screens have a D-491 report. Summary D-491 reports are also available for bridges, sign structures, walls, miscellaneous structures and APRAS data. D-491 reports that contain inspection information will only print the last routine inspection for that structure.

The Department has also created inspection history reports that display the condition ratings of all inspections in a tabular format. The **d\_inspection\_appraisal\_history** and **d\_scour\_underwater\_insp\_history** display condition rating data for all inspections that were performed on that structure.

## 3.0 BMS2 SCREENS

The following is a list of the standard Pontis screens for which labels are required along with the corresponding label prefix assigned to the screen. In general, the first position of the label prefix corresponds to the tab number for the screen on the Inspection Desktop (or the tab from which the screen is opened, in the case of the pop ups). The second position of the prefix is a letter that corresponds to the sequence of sub-tabs on the parent tab. Note that the Agency Project screen does not follow the standard because it is not on the Inspection Desktop:

| Screen                                           | Label Prefix |
|--------------------------------------------------|--------------|
| Inspection Condition Card                        | 1A           |
| Inspection Condition - Create/Edit Element Popup | 1B           |
| Inspection Notes Card                            | 2A           |
| Inspection Work Card                             | 3A           |
| NBI Project Data Popup                           | 3B           |
| Inspection Appraisal Card - Other Ratings        | 4A           |
| Inspection Appraisal Card - Load Ratings         | 4B           |
| Inspection Inventory - ID/Admin                  | 5A           |
| Inspection Inventory - Design                    | 5B           |
| Inspection Inventory - Roads                     | 5C           |
| Inspection Inventory - Structure Units           | 5D           |
| Inspection Inventory - Classification            | 5E           |
| Agency Bridge                                    | 6A           |
| Agency Inspection                                | 6B           |
| Agency Roadway                                   | 6C           |
| Inspection Schedule Card                         | 7A           |
| Agency Project                                   | AP           |

The following is a list of the PennDOT-specific applet screens/tabs and the corresponding label prefix assigned to the screen. In general, the first position of the label prefix is a letter that corresponds to the applet on which the tab appears (e.g., I = Inspection). The second position of the prefix is a letter that corresponds to the purpose of the tab (e.g., F = Fracture Critical):

| Screen                                 | Label Prefix |
|----------------------------------------|--------------|
| Inventory - Location                   | VL           |
| Inventory - Posting                    | VP           |
| Inventory - Paint                      | VA           |
| Inventory - Maintenance Responsibility | VM           |
| Inventory - Design                     | VD           |
| Inventory - Drawing and Notes          | VN           |
| Inventory - Inspection Planning        | VI           |
| Inventory - Sign / Light               | VS           |
| Inventory - Wall                       | VW           |
| Inventory - Misc. Other Structure      | VO           |
| Inspection - Safety Feature            | IA           |
| Inspection - Load Rating               | IR           |
| Inspection - Fracture Critical         | IF           |
| Inspection - Underwater / OSA          | IU           |
| Inspection - Underwater / Sub Units    | IN           |
| Inspection - Underwater / Other        | IL           |
| Inspection - Sign Detail               | ID           |
| Inspection - Comments                  | IC           |
| Inspection - Maintenance               | IM           |
| Inspection - Sign / Light              | IS           |
| Inspection - Wall                      | IW           |
| Inspection - Misc. Other Structure     | IO           |
| Feature Intersected - Utility          | FT           |
| Feature Intersected - Railroad         | FR           |
| Feature Intersected - Waterway         | FW           |
| APRAS Span - Span                      | SP           |
| APRAS Span - APRAS Span                | SS           |
| APRAS Span - Load Capacity             | SL           |
| ARPAS Span - Load Capacity Details     | SL           |
| APRAS Span - Permit                    | SC           |
| APRAS Span - Clearance Details         | SC           |
| Create Structure                       | CS           |

The three-character format for the field prefixes in the old BMS coding guide could not be used for the new BMS2. Between the two lists there are a total of 44 screens, preventing the use of a single prefix character to designate the screen. As with the old BMS, most of the screens contain more than 10 fields and therefore required a two digit sequence number.

## 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.

| Key:       | Structure Unit ID:       | Type:    |     |           |           |           |           |           |
|------------|--------------------------|----------|-----|-----------|-----------|-----------|-----------|-----------|
| Elem / Env | 1B01 Element Description | 1A10 Qty | UOM | 1A11 Qty1 | 1A11 Qty2 | 1A11 Qty3 | 1A11 Qty4 | 1A11 Qty5 |
|            |                          | (LF)     |     |           |           |           |           |           |

Compare:

1A12 Elem Cond

State:

### Condition Rating Codes Used For the Following Items

In order 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 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 \(FHWA Green Book\)](#)

## 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    | Yes  | 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  | N    | Yes  |      |
|                |                          | Water      | Yes              | Yes  | Yes  | Yes  | Yes  | Yes  | N    | 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  | N    | Yes  |      |
|                |                          |            | Water            | Yes  | Yes  | Yes  | Yes  | Yes  | Yes  | N    | 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

(Old BMS Item E17)

### 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 |
| Category #3<br>Light Deterioration     | 9      | none                                                                                        | none |                      | 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<br>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<br>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

(Old BMS Item E20)

### 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 given by 4A08, Scour Critical Bridges, may have significant effect on 1A02 if scour has substantially affected the overall condition of the substructure.

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 on page 3-4.

## \*1A03 Culvert - Culvert Condition Rating

(Old BMS Item E22)

### 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:

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

(Old BMS Item E18)

### 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.<sup>1</sup> Otherwise, base it on the superstructure, excluding the deck.

**Coding:**

Refer to CONDITION RATING CODES on page 3-4.

Superstructure condition rating guidelines for Non-Composite Prestressed Concrete Adjacent Box Beams

| Condition Rating | Percent # Strands Exposed<br>(single beam) | Other 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%                                                                     |
|                  |                                            | Transverse Cracks                         | None                                                                                            |
|                  |                                            | 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.

<sup>1</sup>This is true for Deck Condition Rating 1A01 ≤ 4.

## \*1A05 Channel - Channel and Channel Protection Condition Rating (Old BMS Item E21)

**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

(Old BMS Item E27)

### 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

**Description:**

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

**Procedure:**

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

## 1A08 Rev Need - Review Needed

**Description:**

This checkbox field indicates whether or not the inspection results should be reviewed.

**Procedure:**

Check or uncheck box to indicate if the inspection results should be reviewed. The box is automatically checked when field inspection data are imported.

**Coding:**

- |           |                                               |
|-----------|-----------------------------------------------|
| Unchecked | Inspection results do not need to be reviewed |
| Checked   | Inspection results need to be reviewed        |

## 1A09 Status - Inspection Status

**Description:**

This item indicates the status of the inspection.

**Procedure:**

Select the appropriate inspection status indicator from the dropdown list.

**Coding:**

- |              |                                                                                             |
|--------------|---------------------------------------------------------------------------------------------|
| New          | The inspection information displayed is new and has not been reviewed                       |
| Submitted    | The inspection information has been submitted and has not been reviewed                     |
| Under Review | The inspection information displayed is currently under review by the Inspection Supervisor |
| Approved     | The inspection information displayed has been approved                                      |

## 1A10 Qty - Element Quantity

**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 Pub. No. 590, "PA CoRe Element Coding Guide" for guidance on coding element quantities.

**1A11 Qty1 / Qty2 / Qty3 / Qty4 / Qty5****Description:**

This five part item is used to record the quantity of the element in each condition state, 1 through 5.

**Procedure:**

Enter the quantity for the element in condition states 2 through 5. The quantity in condition state 1 will be automatically calculated by the system by subtracting the quantities in condition states 2 through 5 from the total quantity (1A10).

**Coding:**

The number of available condition states will vary by element from 3 to 5. Refer to Pub. No. 590, "PA CoRe Element Coding Guide" for guidance on coding element quantities.

**1A12 Elem Cond - Element Condition****Description:**

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

**Procedure:**

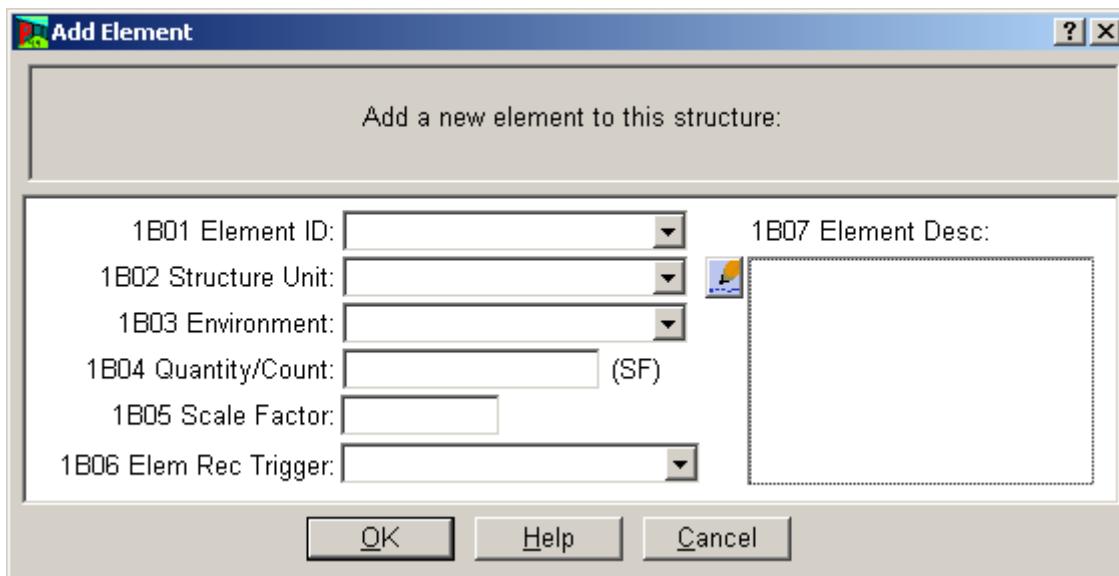
Enter notes about the condition of the currently selected element. Click on the pencil icon beside the comment to open the Notes screen.

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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 Pontis, 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

**Description:**

This item indicates the desired element for the condition unit.

**Procedure:**

Select the desired element from the dropdown list.

Refer to Pub. No. 590, "PA CoRe Element Coding Guide" for element definitions.

### 1B02 Structure Unit

**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

### 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 Quantity/Count

### Description:

This item is used to record the total quantity of the element in this structure unit and environment.

### 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 Pub. No. 590, "PA CoRe Element Coding Guide" for guidance on coding element quantities.

## 1B05 Scale Factor

### 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 Pub. No. 590, "PA CoRe Element Coding Guide", for applicable scale factor elements.

## 1B06 Elem Rec Trigger - Element Record Trigger

**Description:**

This item is used to trigger formula calculations for the condition unit.

**Procedure:**

Select "On" or "Off" to set the element record trigger for the element.

When set to "On", formulas can change the information related to the element (e.g. to set initial values for the condition distribution for a given type of element). When set to "Off", formulas will not be able to update the information.

**Coding:**

- |     |                                                                                                            |
|-----|------------------------------------------------------------------------------------------------------------|
| On  | Element Record Trigger is on, formulas can change the information related to the element.                  |
| Off | Element Record Trigger is off, formulas will not be able to update the information related to the element. |

**NOTE: The Element Record Trigger shall be set to "Off" for all elements.**

## 1B07 Element Desc - Element Description

**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"

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## 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

(Old BMS AL screen)

#### 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.

**NOTE: Narrative Data from the old BMS AL screen has been transferred to this field.**

### 2A02 Insp Notes - Inspection Notes

(Old BMS Item T18)

#### 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. Some fields on this screen are automatically filled in based on the information entered on the Inspection - Maintenance (IM) screen. Any fields that require edits must be made on the Inspection-Maintenance Screen.

### 3A01 Type - Type of Work

#### Description:

This display only item indicates the type of work candidate.

#### Procedure:

Several fields on the screen are made active or inactive based on the type of work candidate selected.

#### Coding:

|                 |                                              |
|-----------------|----------------------------------------------|
| Bridge          | Structure replacement or improvement actions |
| Element         | Preservation action on a particular element  |
| Flexible Action | Agency defined flexible action               |

#### NOTE:

All BMS maintenance items from the old BMS AH screen have been converted as Flexible Actions.

## 3A02 Cand ID - Candidate ID

### 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:

The Department will utilize the Pontis generated ID number. This ID should not be changed.

## 3A03 Structure Unit

(Old BMS Item H03)

### Description:

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

### Procedure:

**This item will be automatically filled in by the system based on information entered in item IM09. This item should not be changed, but the displayed value should be confirmed.**

## 3A04 Estimated Quantity

(Old BMS Item H05)

### Description:

This item is used to record the estimated quantity of the element on which the work should be performed.

### Procedure:

**This item will be automatically filled in by the system based on information entered in item IM04. This item should not be changed, but the displayed value should be confirmed.**

## 3A05 Element

### Description:

This item is used to select the element to which the work candidate applies.

### Procedure:

**This item will be automatically filled in by the system based on information entered in item IM02. This item should not be changed, but the displayed value should be confirmed.**

**3A06 Action**

(Old BMS Item H02)

**Description:**

This item is used to select the action that should be performed for the work candidate.

**Procedure:**

**This item will be automatically filled in by the system based on information entered in item IM03.  
This item should not be changed, but the displayed value should be confirmed.**

**3A07 Estimated Cost**

(Old BMS Item H06)

**Description:**

This item is used to record the estimated cost of the work candidate.

**Procedure:**

**This item will be automatically filled in by the system based on information entered in item IM10.  
This item should not be changed, but the displayed value should be confirmed.**

**3A08 Priority**

(Old BMS Item H08)

**Description:**

This item is used to identify the priority of the work candidate.

**Procedure:**

**This item will be automatically filled in by the system based on information entered in item IM05.  
This item should not be changed, but the displayed value should be confirmed.**

**3A09 Date Recomm - Date Recommended**

(Old BMS Item H10)

**Description:**

This item is used to record the date the work candidate was recommended.

**Procedure:**

**This item will be automatically filled in by the system based on information entered in item IM06.  
This item should not be changed, but the displayed value should be confirmed.**

## 3A10 Applicable Condition States

### Description:

This five part checkbox field is used to indicate on which condition states for the element work should be performed.

### Procedure:

Check the boxes corresponding to condition states 1 through 5 to indicate that work should be performed on the element in that condition state. Use the "Select All" button to quickly select all condition states.

This field is active only for Element work candidates.

### Coding:

|           |                                                          |
|-----------|----------------------------------------------------------|
| Unchecked | Do not perform work on the corresponding condition state |
| Checked   | Perform work on the corresponding condition state        |

## 3A11 Target Year

(Old BMS Item H12)

### Description:

This item is used to record the tentative implementation or actual program year of the maintenance activity.

### Procedure:

**This item will be automatically filled in by the system based on information entered in item IM08.  
This item should not be changed, but the displayed value should be confirmed.**

## 3A12 Assigned - Assigned Indicator

### Description:

This display only item indicates whether the work candidate has been assigned to a project.

### Procedure:

This item is set in the Project Planning module and cannot be edited on this screen.

### Coding:

|     |                                                       |
|-----|-------------------------------------------------------|
| Yes | The work candidate has been assigned to a project     |
| No  | The work candidate has not been assigned to a project |

## **3A13 Work Assign - Work Assignment**

(Old BMS Item H09)

**Description:**

This item is used to record if the maintenance activity is a candidate for completion by Department forces or by contract.

**Procedure:**

**This item will be automatically filled in by the system based on information entered in item IM11. This item should not be changed, but the displayed value should be confirmed.**

## **3A14 Status - Status of Work Candidate**

**Description:**

This item is used to indicate status of the work candidate.

**Procedure:**

**This item will be automatically filled in by the system based on information entered in item IM07. This item should not be changed, but the displayed value should be confirmed.**

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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 screen, click on the "NBI Project Info..." button located in the Work tab.

NBI Project Data

Bridge:

Metric  English

3B01 Proposed Deck/Super Work:

3B02 Proposed Sub Work:

3B03 Improvement Length:  ft

3B04 Improvement Cost:

3B05 Roadway Improvement Cost:

Total Cost (96):

3B07 Year of Estimate:

Save Help Close

### 3B01 Proposed Deck/Super Work

(Old BMS Item F02)

#### 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.

| <b>Code</b> | <b>Deck Work</b>                                                                |   | <b>Superstructure Work</b>                               |
|-------------|---------------------------------------------------------------------------------|---|----------------------------------------------------------|
| 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<br>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**

(Old BMS Item F02)

**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**

(Old BMS Item F05)

**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**

(Old BMS Item F20)

**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 (Old BMS Item F21)

### 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 (Old BMS Item F24)

### 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 (Old BMS Item F01)

### 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.

## 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.

**Structure Appraisal:**

- 4A01 Open/Posted/Closed: [dropdown]
- 4A02 Approach Alignment: [dropdown]
- 4A03 Bridge Railings: [dropdown]
- 4A04 Transitions: [dropdown]
- 4A05 Approach Guardrail: [dropdown]
- 4A06 Appr Guardrail Ends: [dropdown]
- 4A07 Pier Protection: [dropdown]
- 4A08 Scour Critical: [dropdown]

**NBI Appraisal Ratings - calculated:**

- 4A09 Structural Eval: [dropdown]
- 4A10 Deck Geometry: [dropdown]
- 4A11 Underclearances: [dropdown]
- 4A12 SD / FO Status: [dropdown]
- 4A13 Sufficiency Rating: [dropdown]
- 4A14 Hlth Ind: [dropdown]

**Minimum Vertical Clearances:**

- 4A15 Over Structure: [dropdown] ft
- 4A16 Under (Reference): [dropdown]
- 4A17 Under Clearance: [dropdown] ft

**Minimum Lateral Underclearance:**

- 4A18 Reference Feature: [dropdown]
- 4A19 Right Side: [dropdown] ft
- 4A20 Left Side: [dropdown] ft

**Navigation Data:**

- 4A21 Nav Control Exists: [dropdown]
- 4A22 Nav Vertical Clr: [dropdown] ft
- 4A23 Nav Horizontal Clr: [dropdown] ft
- 4A24 Min Vert Lift Clr: [dropdown] ft

### 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 of 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

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

### 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. This field should not be changed, but the displayed value should be confirmed.

## \*4A02 Approach Alignment - Approach Roadway Alignment Appraisal (Old BMS Item E28)

### 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 slight distances and sharp right angle type horizontal curves on the approach to and from the bridge. Code "N" for structures under fill where full roadway cross section is carried across the structure. Speed reduction necessary because of structure width and not alignment shall not be considered in evaluating this item.

#### Coding:

- 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

Non-italics indicate original FHWA coding. Records of accidents and/or damage to guiderail attributed to poor alignment should be considered.

## \*4A03 Bridge Railings

#### Description:

This item indicates the adequacy of bridge railings.

#### Procedure:

**This item will be automatically filled in by the system based on information entered in item IA02.  
This item should not be changed, but the displayed value should be confirmed.**

#### Coding:

Refer to Traffic Safety Features Rating Codes.

## \*4A04 Transitions

**Description:**

This item indicates the adequacy of transition from approach rail to bridge rail.

**Procedure:**

This item will be automatically filled in by the system based on information entered in item IA02.  
This item should not be changed, but the displayed value should be confirmed.

**Coding:**

Refer to Traffic Safety Features Rating Codes.

## \*4A05 Approach Guiderail

**Description:**

This item indicates the adequacy of the approach guiderail.

**Procedure:**

This item will be automatically filled in by the system based on information entered in item IA02.  
This item should not be changed, but the displayed value should be confirmed.

**Coding:**

Refer to Traffic Safety Features Rating Codes.

## \*4A06 Appr Guiderail Ends - Approach Guiderail Ends

**Description:**

This item indicates the adequacy of the approach guiderail ends.

**Procedure:**

This item will be automatically filled in by the system based on information entered in item IA02.  
This item should not be changed, but the displayed value should be confirmed.

**Coding:**

Refer to Traffic Safety Features Rating Codes.

## \*4A07 Pier Protection - Dolphins & Fenders

(Old BMS Item D12-A)

### 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", leave this item blank to indicate not applicable.

### 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

(Old BMS Items E29-A and W06)

### Description:

This item indicates the current status of the bridge regarding its vulnerability to scour. The scour calculation/analysis and field inspections for this determination will be made by hydraulic/foundation engineers. A scour critical bridge 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.

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

### Notes:

1. Additional clarification comments to the FHWA coding for this item appear in italicized print.
2. Those bridges deleted from the initial scour screening list (coded as Deleted on the Structure Notes field, Item 2A01) should have a code of 9, 8, 7, 5, or 4.
3. Whenever a bridge's coding is revised from a "6" by analysis or further screening into a category which is not at risk, it should also be coded with a Delete on the Structure Notes field, Item 2A01.

**Coding:**

- N Bridge not over waterway – *highway or railroad grade crossing*
- 9 Bridge foundation (including piles) well above flood water elevation - *high gorge structure, abutment and/or piers well set back from the main channel, bridge over concrete or gabion lined channel.* (1)
- 8 Bridge foundation determined to be stable for calculated scour conditions; calculated scour is above the top of the footing – *Bridges with spread footings on rock classified as being competent, bridges analyzed as stable for calculated scour conditions with the footing not exposed, culverts assessed as low risk during scour screening. New bridges with properly designed countermeasures.*
- 7 Countermeasures have been installed to correct a previous existing problem with scour. Bridge is no longer scour critical. *Countermeasures have effectively negated the scour potential and have been verified by analysis.*
- 6 Scour calculation/evaluation has not been made. (Use only to describe case where bridge has not yet been evaluated for scour potential). *Scour screening indicates that the bridge may be susceptible to scour but the site has not yet been analyzed or has an unknown foundation. Bridges in this category should be coded as High, Medium or Low in the Structure notes field (Item 2A01) on the Notes screen and/or the foundation types should be coded as "P" or "X" for items VD15 and VD17 on Inventory Applet, Design Tab, as well as item IN14 on Inspection Applet screen, Underwater Sub-Units Tab.*
- 5 Bridge foundation determined to be stable for calculated scour conditions; scour within limits of footing or piles. *Bridge site has been analyzed for scour and stability and calculations establish it to be stable even though the predicted depth of scour is below the top of the footing.*
- 4 Bridge foundation determined to be stable for calculated scour conditions; field review indicates action is required to protect exposed foundations from effects of additional erosion and corrosion. *Bridge site has been analyzed for scour and stability and calculations establish it to be stable, however, countermeasures such as debris removal or rip-rap are needed to protect exposed foundations.*
- 3 Bridge is scour critical; foundations determined to be unstable for calculated scour conditions:
- 1) Scour within limits of footing or piles
  - 2) Scour below spread footing base or pile tips  
*Bridge site has been analyzed for scour and stability and calculations show the bridge to be at risk due to potential scour. The threat may be either from undermining or instability.*
- 2 Bridge is scour critical; field review indicates that extensive scour has occurred at bridge foundations. Immediate action is required to provide scour countermeasures.  
*Bridge inspection reveals that scour has occurred at the site, which has caused distress in substructure components and could potentially threaten the structure. Countermeasures are needed immediately to protect the foundation elements from further scour. Note: if the structure warrants a rating of 2, encode the proper substructure unit on the IM screen with a priority code of "0" or "1" until repairs are made.*
- 1 Bridge is scour critical; field review indicates that failure of piers/abutments is imminent. Bridge is closed to traffic.  
*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 the proper substructure unit on the IM screen with a priority code of "0" or "1" until repairs are made.*
- 0 Bridge is scour critical. Bridge has failed and is closed to traffic due to scour.

**Definitions:**

**Analyzed** - The structure has received a full engineering evaluation which includes calculation of hydrology, hydraulics, scour and foundation stability.

Not all structures will require evaluation; i.e., spread footings on non-erodible bedrock or greater than three feet into rock, would require rock classification and a check of foundation stability only.

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

## \*4A09 Structural Eval - Structural Evaluation

(Old BMS Items E24, S30, T17)

### Description:

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

### Procedure:

The Appraisal Rating is based partially on the superstructure, substructure condition ratings and the load carrying capacity.

The bridge is appraised not only on physical condition, but also on load carrying capacity of the superstructure and substructure. Therefore, a well maintained bridge may still 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).

Of first importance are those items whose malfunction or loss would adversely affect the integrity of the structure. For example, a loose expansion device, a pier cap that needs concrete work, or a damaged truss portal, should not classify a bridge as a "basically intolerable condition".

This item will generally be coded no higher than the lowest condition rating of the superstructure or the substructure (or culvert item 1A03).

The code is also based on the value obtained from Table 1 which evaluates the inventory rating (HS equivalent) shown for various traffic volumes.

For other than culverts, the lowest of the codes obtained from item 1A04, Superstructure, item 1A02, Substructure or Table 1 is used.

### Coding:

Refer to APPRAISAL RATING CODES on page 3-32 and Table 1 on Page 3-38.

**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.

**TABLE 1**  
**Rating by Comparison of ADT (5C10) and Inventory Rating (IR10)**

| Structural Evaluation Rating Code | Inventory Rating                                                                     |               |               |
|-----------------------------------|--------------------------------------------------------------------------------------|---------------|---------------|
|                                   | Average Daily Traffic (ADT)                                                          |               |               |
|                                   | 0-500                                                                                | 501-5000      | >5000         |
| 9                                 | >36*<br>(HS20)**                                                                     | >36<br>(HS20) | >36<br>(HS20) |
| 8                                 | 36<br>(HS20)                                                                         | 36<br>(HS20)  | 36<br>(HS20)  |
| 7                                 | 31<br>(HS17)                                                                         | 31<br>(HS17)  | 31<br>(HS17)  |
| 6                                 | 23<br>(HS13)                                                                         | 25<br>(HS14)  | 27<br>(HS15)  |
| 5                                 | 18<br>(HS10)                                                                         | 20<br>(HS11)  | 22<br>(HS12)  |
| 4                                 | 12<br>(HS7)                                                                          | 14<br>(HS8)   | 18<br>(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 this item is the reason for closure                                               |               |               |

\* Coded HS rating load (typical) (Load Factor)

\*\* HS designation (typical)

## \*4A10 Deck Geometry - Deck Geometry Appraisal

(Old BMS Item E25)

### 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 lower code for values between those listed in the tables.

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**Coding:**

Refer to Tables 2A, 2B, 2C, 2D, and 2E. Code "N" for non-highway related features.

**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)**

| Deck Geometry Rating Code (4A10) | TABLE 2A                                                                  |         |          |           |           |          | TABLE 2B                                   |         |
|----------------------------------|---------------------------------------------------------------------------|---------|----------|-----------|-----------|----------|--------------------------------------------|---------|
|                                  | Bridge Roadway Width (feet)<br>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)<br>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<br>(11N+7)* | 30                                 | 11N+6   | 18                                 | 12N+4   |
| 3                                | 33 (28)*                                                                  | 11N+11<br>(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 (4A17) 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

(Old BMS Item E26)

### 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<br>Clearanc<br>e Rating<br>Code<br>(4A11)       | Minimum Vertical Clearance (feet)                                                  |         |                                         |                                      | Railroad |  |
|-------------------------------------------------------|------------------------------------------------------------------------------------|---------|-----------------------------------------|--------------------------------------|----------|--|
|                                                       | Functional Class                                                                   |         |                                         |                                      |          |  |
|                                                       | Interstate & Other Freeways                                                        |         | Other Principal<br>& Minor<br>Arterials | Major & Minor<br>Collectors & Locals |          |  |
| All Routes -<br>Except as<br>noted for<br>Urban Areas | Undesignated<br>Routes -<br>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<br>Clearanc<br>e Rating<br>Code<br>(4A11) | Minimum Lateral Underclearance (feet)                                              |       |      |       |                                         |                                      |     | Railroad |  |  |  |  |  |
|-------------------------------------------------|------------------------------------------------------------------------------------|-------|------|-------|-----------------------------------------|--------------------------------------|-----|----------|--|--|--|--|--|
|                                                 | Functional Class                                                                   |       |      |       |                                         |                                      |     |          |  |  |  |  |  |
|                                                 | 1 way Traffic                                                                      |       |      |       | 2 way Traffic                           |                                      |     |          |  |  |  |  |  |
|                                                 | Principal Arterials - Interstate,<br>Freeways or Expressways                       |       |      |       | Other Principal<br>& Minor<br>Arterials | Major & Minor<br>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     | 8                                       | 6                                    | 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 Status - Structurally Deficient or Functionally Obsolete Status**

(Old BMS Item M08)

### **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, the new Sufficiency Rating will be updated overnight and displayed the following day.

### **Note:**

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

### **Coding:**

- 1 Structurally Deficient
- 2 Functionally Obsolete

#### Structurally Deficient:

1. Condition Rating of 4 or Less for:

1A01, Deck or  
1A04, Superstructure or  
1A02, Substructure or  
1A03, Culvert

OR

2. Appraisal Rating of 2 or Less for:

4A09, Structural Condition or  
1A06, Waterway Adequacy

#### Functionally Obsolete:

1. Appraisal Rating of 3 or Less for:

4A10, Deck Geometry or  
4A11, Underclearances or  
4A02, Approach Roadway Alignment

OR

2. Appraisal Rating of 3 or Less for:

4A09, Structural Condition or  
1A06, Waterway Adequacy

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

(Old BMS Item M05)

### **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 Hlth Ind - Health Index

### Description:

This display only item indicates the Health Index of the structure.

### Procedure:

Computed and entered automatically by the system based on the condition distribution for the different elements on a structure

### Coding:

A specific number, to the nearest tenth, computed by the system.

Range: 0.0 - 100.0

100.0 Best condition  
0.0 Worst condition

## \*4A15 Over Structure - Minimum Vertical Clearance Over Bridge Roadway

### 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. This item should not be changed, but the displayed value should be confirmed.

## 4A16 Under (Reference) - Minimum Vertical Underclearance Reference Feature

### Description:

This item indicates the reference feature from which the minimum vertical underclearance measurement is taken.

### Procedure:

Select the code which indicates the reference feature from which the minimum vertical underclearance measurement is taken.

### Coding:

H Highway beneath structure  
R Railroad beneath structure  
N Feature not a highway or railroad

## \*4A17 Under Clearance - Minimum Vertical Underclearance

### 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. This item should not be changed, but the displayed value should be confirmed.

## 4A18 Reference Feature - Minimum Lateral Underclearance Reference Feature

### 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

(Old BMS Item B20)

### 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 <sup>1</sup>nearest 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).

<sup>1</sup>Note: 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

(Old BMS Item B20)

### 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 <sup>1</sup>nearest 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

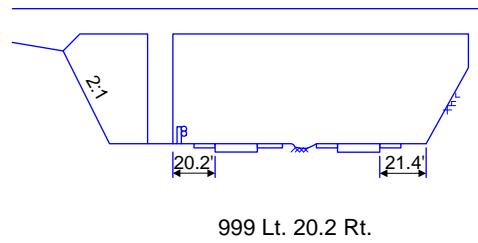
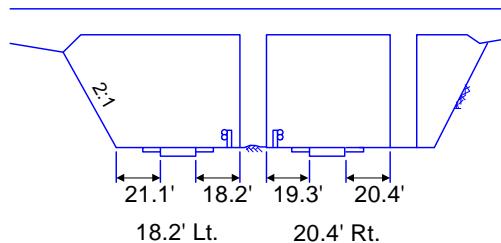
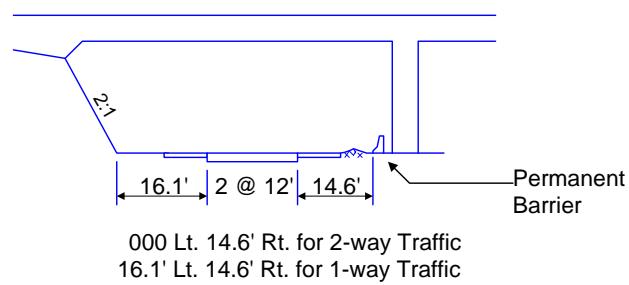
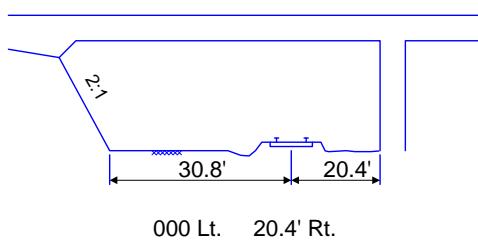
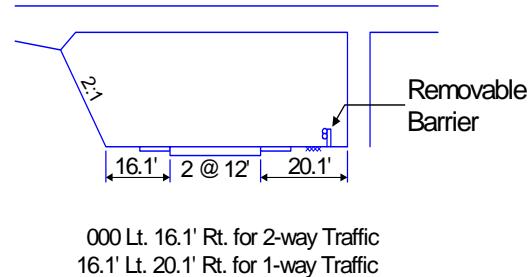
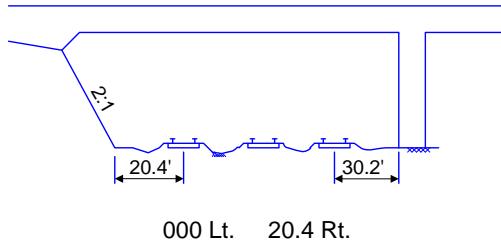
### Reference:

FHWA's Recording and Coding Guide for the Structural Inventory and Appraisal of the Nation's Bridges. (FHWA Green Book).

<sup>1</sup>Note: Curbs are not obstructions for this item.

**Note:**

The purpose of this item is to identify available space for future lanes under the bridge.



## \*4A21 Nav Control Exists - Does Navigation Control Exist?

(Old BMS Item D12)

### 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.

### Coding:

- 0     Navigation control does not exist.
- 1     Navigation control exists.
- N     Not applicable, no water.

## \*4A22 Nav Vertical Clr - Navigation Vertical Clearance

(Old BMS Item D12)

### 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

(Old BMS Item D12)

### 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**

(Old BMS Item D12)

**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.

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## 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 Items 4B01 and 4B03 are automatically filled in based on the information entered on the Inspection - Load Rating (IR) screen. Any fields (except for items 4B01 and 4B03) that require edits must be made on the Inspection-Load Rating Screen.

**Bridge Inspection Mode: Edit Type: R - Regular (routine) Key: 0010**

Bridge:  Find... Inspections (10):  Metric English Reports... Save

1 CONDITION 2 NOTES 3 WORK 4 APPRAISAL 5 INVENTORY 6 AGENCY 7 SCHEDULE

**NBI Load Ratings:**  
4B01 Design Load 4B02 Rat Dt Initials 4B03 Posting:

4B04 Operating Type:  4B06 Inventory Type:   
4B05 Oper Rating:  ton 4B07 Inv Rating:  ton

**Alternate Load Ratings:**  
4B08 H20 Op Rat Typ:  4B10 H20 Inv Rat Typ:   
4B09 H20 Op Rating:  ton 4B11 H20 Inv Rating:  ton

**Posting Loads by Truck Type:**

| Operating                            | Inventory                |
|--------------------------------------|--------------------------|
| 4B12 ML80: <input type="text"/> ton  | <input type="text"/> ton |
| 4B13 TK527: <input type="text"/> ton | <input type="text"/> ton |
| Do Not Use <input type="text"/> ton  | <input type="text"/> ton |

4B15 Load Rat Rev Recommended:

**1 Other Ratings**

**2 Load Ratings**

## \*4B01 Design Load

(Old BMS Item C03)

### 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

### 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% pf 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

**Example:** The bridge was designed for an HS20 load.

Code: 5

## 4B02 Rat Dt, Initials - Rating Date and Initials

### 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 IR02. This item should not be changed, but the displayed value should be confirmed.

## \*4B03 Posting - Bridge Posting

(Old BMS Item E29)

### Description:

This item indicates the appraisal of the load capacity of the bridge.

### Procedure:

Select the code which indicates the appraisal of the load capacity of the bridge.

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 be 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:

| <u>Code</u>                                                      | <u>Lowest<br/>Ratio*</u> | <u>H20Rating<br/>In Tons</u> | <u>HS-20 Rating<br/>In Tons</u> | <u>ML-80Rating<br/>In Tons</u> | <u>TK-527 Rating<br/>In Tons</u> |
|------------------------------------------------------------------|--------------------------|------------------------------|---------------------------------|--------------------------------|----------------------------------|
| 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                           | 37-38                          | 40-42                            |
| 4                                                                | 0.91-0.99                | 19                           | 33-35                           | 34-36                          | 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                   |
| <hr/>                                                            |                          |                              |                                 |                                |                                  |
| *Ratio = <u>H20</u> <u>HS20</u> <u>ML80</u> <u>TK527</u>         |                          |                              |                                 |                                |                                  |
| <u>RATING</u> OR <u>RATING</u> OR <u>RATING</u> OR <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

## 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. This item should not be changed, but the displayed value should be confirmed.

## \*4B05 Oper Rating - Operating Rating

### Description:

This item is used to record the Operating Rating for the structure. The operating rating is that load which produced the operating rating stresses specified in the current AASHTO Manual for Maintenance Inspection of Bridges. 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:

This item will be automatically filled in by the system based on information entered in item IR11. This item should not be changed, but the displayed value should be confirmed.

## \*4B06 Inventory Type - Inventory Rating Type

### Description:

This item records the method of analysis used in determining the Inventory ratings.

### Procedure:

This item will be automatically filled in by the system based on information entered in item IR06. This item should not be changed, but the displayed value should be confirmed.

## \*4B07 Inv Rating - Inventory Rating

### Description:

This item is used to record the inventory rating for the structure. The inventory rating is that load which produces the inventory rating stresses specified in the current AASHTO Manual for Maintenance Inspection of Bridges, 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:

This item will be automatically filled in by the system based on information entered in item IR10. This item should not be changed, but the displayed value should be confirmed.

## 4B08 H20 Op Rat Typ - H20 Operating Rating Type

### 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.  
This item should not be changed, but the displayed value should be confirmed.

## 4B10 H20 Inv Rat Typ - H20 Inventory Rating Type

### Description:

This item indicates the type of loading for the H20 inventory rating.

### Procedure:

This item will be automatically filled in by the system based on information entered in item IR06.  
This item should not be changed, but the displayed value should be confirmed.

## \*4B11 H20 Inv Rating - H20 Inventory 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.  
This item should not be changed, but the displayed value should be confirmed.

## \*4B12 ML80

### 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. This item should not be changed, but the displayed value should be confirmed.

**\*4B13 TK527****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. This item should not be changed, but the displayed value should be confirmed.

**\*4B14 Truck Type 3****Description:**

This item is reserved and will not be used

**4B15 Load Rate Rev Recommended - Load Rating Review Recommended****Description:**

This checkbox field indicates whether or not a review of the load ratings is recommended.

**Procedure:**

This item will be automatically filled in by the system based on information from the Load Rating Review Recommended Checkbox on the Load Rating Tab in Inspection applet. This item should not be changed, but the displayed value should be confirmed.

## 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

(Old BMS Item A01)

#### 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       | 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       |                 |          |

### **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)

#### **Example:**

PA Turnpike, Route 195:

**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 4<sup>th</sup> through 7<sup>th</sup> 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 3<sup>rd</sup> and 4<sup>th</sup> digits plus the 4 digits provided for offset of the bridge to record the location of the bridge.For railroad owned and inventoried structures, use the 2<sup>nd</sup>, 3<sup>rd</sup> and 4<sup>th</sup> 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

(Old BMS Item A06)

### 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

### 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

### 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

### 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

(Old BMS Item A09)

### 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 form the list in Appendix B.

### 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**

(Old BMS Item B32)

**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**

(Old BMS Item B33)

**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**

(Old BMS Item A06)

**Description:**

This item is used to record the bridge location in a narrative form. The description is limited to 25 characters.

**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**

(Old BMS Item A07)

**Description:**

This item is used to record the latitude of the bridge location.

**Procedure:**

The latitude should be measured and entered to the nearest hundredth of a second. Latitude should be measured at the beginning of the bridge or at some other convenient point on the bridge.

This item is required for all bridges on the STRAHNET Highway System. It is recommended this item be coded for all bridges.

**Coding:**

The latitude, in degrees, minutes, and seconds to the nearest hundredth of a second.

**Example:**

A bridge's location is 42 degrees, 7 minutes, and 21.00 seconds latitude

42d 07' 21.00"

**\*5A11 Long - Longitude of Bridge Location**

(Old BMS Item A08)

**Description:**

This item is used to record the longitude of the bridge location.

**Procedure:**

The longitude should be measured and entered to the nearest hundredth of a second. The longitude should be measured at the beginning of the bridge or at some other convenient point on the bridge.

This item is required for all bridges on the STRAHNET Highway System. It is recommended this item be coded for all bridges.

**Coding:**

The longitude, in degrees, minutes, and seconds to the nearest hundredth of a second.

**Example:**

A bridge's location is 76 degrees, 5 minutes, and 06.00 seconds longitude:

76d 05' 06.00"

## \*5A12 Bord St/FHWA Reg - Name of Border State / FHWA Region / Share Percentage

(Old BMS Items A04-A and A04-B)

### 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 | NA                          | NA                           |

#### 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

(Old BMS Item A04-C)

### 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**

(Old BMS Item A37)

**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**

(Old BMS Item A16)

**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: 1997

**\*5A16 Year Reconstruct - Year of Last Major Reconstruction on the Bridge**

(Old BMS Item A17)

**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. This may be determined from data on the Agency Project (AP) screen. 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

(Old BMS Item A26)

### 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 (Old BMS value was T)
- S Sign Structure
- T Tunnel
- X Demolished/Replaced

**Note:**

Streets should be treated as highways, not a private road or other. A private road is a highway, road or street not under public authority jurisdiction, not maintained by public authority and not open to the public.

\*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**

(Old BMS Item A26)

**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:**

Streets should be treated as highways, not a private road or other. A private road is a highway, road or street not under public authority jurisdiction, not maintained by public authority and not open to the public.

**Examples:**

Bridge over river:

Tunnel:

Retaining wall structure parallel with highway:

**\*5A19 # Lanes Under - Lanes Under the Structure**

(Old BMS Items B34, B11, S20A)

**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 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**

(Old BMS Item A23)

**Description:**

This item indicates which agency is responsible to maintain what portion of the bridge.

**Procedure:**

**This item will be automatically filled in by the system based on information entered in item VM03.  
This item should not be changed, but the displayed value should be confirmed.**

**\*5A21 Owner - Owner or Principal Custodian of the Bridge**

(Old BMS Item A20)

**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                      | 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                                   |

**5A22 On/Off Agency Sys - On or Off Agency System****Description:**

This item indicates whether the bridge is on or off the Agency's system.

**Procedure:**

**Do not use.**

**5A23 Agency Admin Area - Agency Administration Area****Description:**

This item indicates the administrative area within which the structure is located.

**Procedure:**

Select the planning organization where the structure is located.

**Coding:**

|                                                    |                   |                             |                          |
|----------------------------------------------------|-------------------|-----------------------------|--------------------------|
| Adams RPO                                          | Harrisburg MPO    | Northwest RPO               | Southern Alleghenies RPO |
| Altoona MPO                                        | Johnstown MPO     | Northern Tier RPO           | SPC MPO                  |
| Centre MPO                                         | Lancaster MPO     | Reading MPO                 | Williamsport MPO         |
| DVRPC MPO                                          | Lebanon MPO       | Scranton – Wilkes-Barre MPO | York MPO                 |
| Erie MPO                                           | Lehigh Valley MPO | SEDA COG RPO                |                          |
| Franklin County – Non-affiliated North Central RPO | NEPA RPO          | Shenango Valley MPO         |                          |

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## 5B Inspection Inventory - Design

The Inspection Inventory - Design Screen shows design-related information about the selected structure.

**Bridge Inspection Mode: Edit Type: R - Regular (routine) Key: 0010**

Bridge:  Find... Inspections (10):  Metric English Reports... Save

1 CONDITION 2 NOTES 3 WORK 4 APPRAISAL 5 INVENTORY 6 AGENCY 7 SCHEDULE

**Deck Information:**

- 5B01 Deck Structure Type:
- 5B02 Deck Surface Type:
- 5B03 Deck Membrane Type:
- 5B04 Deck Protection:
- Curb/Sidewalk Width: 5B05 Left:  ft
- 5B06 Right:  ft
- 5B07 Deck Width:  ft
- 5B08 Bridge Median:
- 5B09 Skew:  degrees
- 5B10 Structure Flared:

**Span Information:**

- 5B11 Number of Main Spans:
- 5B12 Main Span Material:
- 5B13 Main Span Design:
- 5B14 Number of Approach Spans:
- 5B15 Approach Span Material:
- 5B16 Approach Span Design:
- 5B17 Maximum Span Length:  ft
- 5B18 Structure Length:  ft
- 5B19 Deck Area:  (SF)
- 5B20 Total Length:  ft

### \*5B01 Deck Structure Type - Bridge Deck Structure Type

#### 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 information entered in item 6A38.  
This item should not be changed, but the displayed value should be confirmed.

## \*5B02 Deck Surface Type - Deck Surface Type (Main Span)

(Old BMS Item C10)

### 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           | 7 Timber                                  |
| 2 Concrete Overlay*  | 8 Gravel                                  |
| 3 Latex Concrete     | 9 Other                                   |
| 4 Low Slump Concrete | 0 None (e.g., steel grid)                 |
| 5 Epoxy Overlay      | N Not applicable                          |
| 6 Bituminous         | (applies only to structures with no deck) |

\*Separate layer of concrete added but not latex modified, low slump, etc

## \*5B03 Deck Membrane Type

(Old BMS Item C10)

### 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

(Old BMS Item C10)

### 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<br>(e.g., Rosphalt 50) | N Not applicable<br>(applies only to structures with no deck) |
| 6 Polymer impregnated                             | S Low corrosion steel (6A42 = 5, 6, or 7)                     |

**\*5B05 Left - Curb / Sidewalk Width on Left**

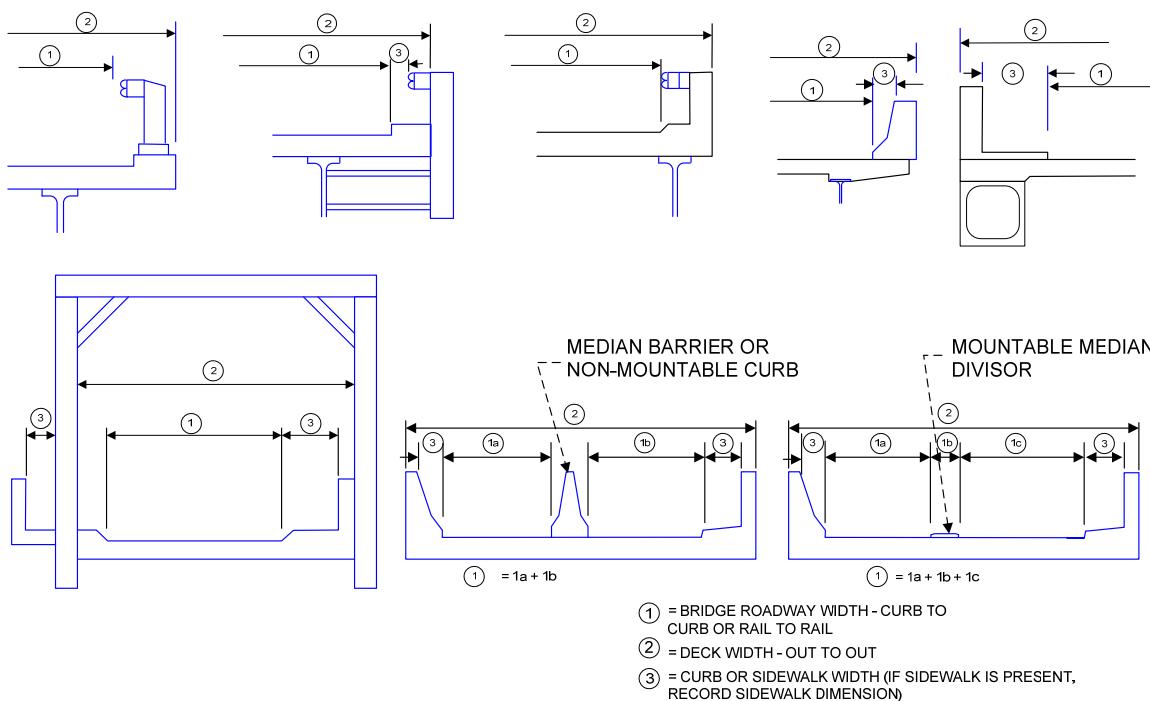
(Old BMS Item A34)

**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

(Old BMS Item A34)

### 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

(Old BMS Item A33)

### 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

### 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. This item should not be changed, but the calculated value should be confirmed.

## \*5B09 Skew - Skew Angle

(Old BMS Item B09)

### 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.<sup>1</sup>

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.

<sup>1</sup> 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?

(Old BMS Item A32)

### 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 Flare

## \*5B11 Number of Main Spans - Total Number of Spans in Main Unit (Old BMS Item C16)

### 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)

### 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 item 6A26.  
This item should not be changed, but the calculated value should be confirmed.**

### Coding:

- |                       |                                     |
|-----------------------|-------------------------------------|
| 1 Concrete            | 6 Prestress concrete continuous     |
| 2 Concrete continuous | 7 Timber                            |
| 3 Steel               | 8 Masonry                           |
| 4 Steel continuous    | 9 Aluminum, wrought iron, cast iron |
| 5 Prestress concrete  | 0 Other                             |

## \*5B13 Main Span Design - Structural Configuration of Main Span (FHWA)

### 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:

- |                                   |                         |
|-----------------------------------|-------------------------|
| 01 Slab                           | 13 Suspension           |
| 02 Stringer/Multi-beam Girder     | 14 Stayed Girder        |
| 03 Girder and Floorbeam System    | 15 Movable – Lift       |
| 04 Tee Beam                       | 16 Movable – Bascule    |
| 05 Box Beam or Girders – Multiple | 17 Movable – Swing      |
| 06 Box Beam or Girders – Single   | 18 Tunnel               |
| 07 Frame                          | 19 Culvert              |
| 08 Orthotropic                    | 20 Mixed Types          |
| 09 Truss – Deck                   | 21 Segmented Box Girder |
| 10 Truss – Thru                   | 22 Channel Beam         |
| 11 Arch – Deck                    | 00 Other                |
| 12 Arch – Thru                    |                         |

## \*5B14 Number of Approach Spans - Total Number of Approach Spans (Old BMS Item C16)

### 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)

### 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.  
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)

### 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

(Old BMS Item C08)

### 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

(Old BMS Items C07, S21, T06)

### Description:

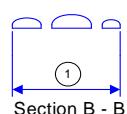
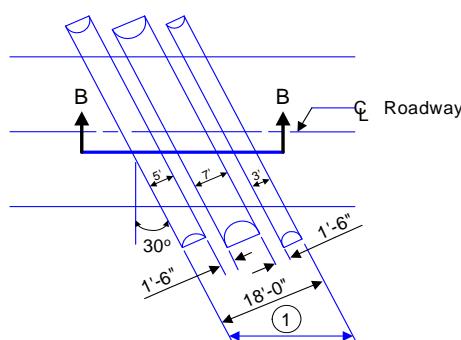
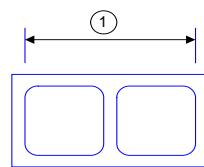
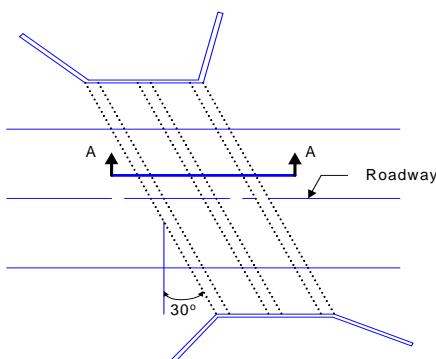
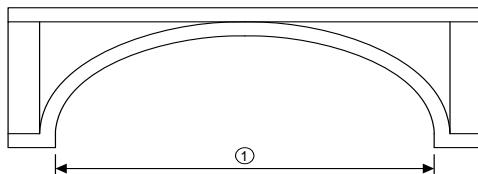
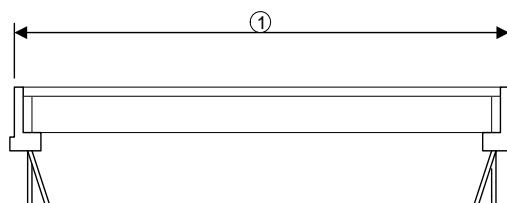
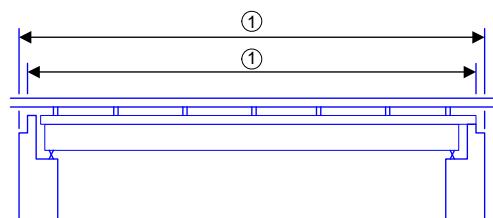
This item is used to record the total overall length of the structure.

### Procedure:

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, 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.

### Coding:

Total length of the bridge to the nearest foot. Code sign structures as 000000.



$$\text{Structure Length} = \frac{18'}{\cos 30^\circ}$$

## 5B19 Deck Area

**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 information entered in items 5B07 and 5B18. This item should not be changed, but the displayed value should be confirmed. The automatic update occurs overnight.

**Coding:**

The deck area to the nearest square foot.

## 5B20 Total Length

**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.

## 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.

**Roadway Name:** [Input Field] **On/Under:** [Input Field] **NBI:** [Input Field] **Route:** [Input Field] **Ref. Post:** [Input Field] **Kind Highway:** [Input Field]

**Roadway Identification:**

- 5C01 Route Name: [Input Field]
- 5C02 NBI Roadway: [Input Field]
- 5C03 Position/Prefix: [Input Field]
- 5C04 Kind Hwy (Rt Pref): [Input Field]
- 5C05 Desig. Lvl. Service: [Input Field]
- 5C06 Rte #/Suffix: [Input Field]
- 5C07 Critical Facility: [Input Field]

**Traffic and Accidents:**

- 5C08 Lanes: [Input Field] Medians: [Input Field] Speed: [Input Field] mph
- 5C09 ADT Class: [Input Field]
- 5C10 Recent ADT: [Input Field] 5C11 Year: [Input Field]
- 5C12 Future ADT: [Input Field] 5C13 Year: [Input Field]
- 5C14 Truck %ADT: [Input Field]
- 5C15 Detour Leng: [Input Field] mi 5C16 Speed: [Input Field] mph
- 5C17 Accident Cnt: [Input Field] Rate: [Input Field]

**Highway Networks & Service Classifications:**

- 5C18 Kilometer/Mile Pt: [Input Field] mi
- 5C19 Nat Base Net: [Input Field]
- 5C20 LRS Inventory Rte: [Input Field] Sub#: [Input Field]
- 5C21 Toll Facility: [Input Field]
- 5C22 Functional Class: [Input Field]
- 5C23 Traffic Direction: [Input Field]

**Clearances:** 5C24 Vertical: [Input Field] ft 5C26 Appr. Road: [Input Field] ft  
5C25 Horiz.: [Input Field] ft 5C27 Roadway: [Input Field] ft

**Widths:** 5C28 Defense Hwy: [Input Field]  
5C29 Nat. Hwy Sys: [Input Field] 5C30 SB: [Input Field]  
5C31 Fed. Lands Hwy: [Input Field] 5C32 Trans: [Input Field]  
5C33 Nat.Truck Network: [Input Field] 5C34 Emer: [Input Field]

**Alternate Classifications:**

**Agency Roadway Fields:**

- 5C35 1: [Input Field] 5C38 4: [Input Field]
- 5C36 2: [Input Field] 5C39 5: [Input Field]
- 5C37 3: [Input Field]

### \*5C01 Route Name - Road / Route Name

(Old BMS Items B03 and D06)

#### 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

## 5C02 NBI Roadway

### Description:

This checkbox field indicates whether or not the selected roadway is an NBI roadway.

### Procedure:

Check or uncheck the box to indicate whether or not the roadway is an NBI roadway.

### Coding:

- |           |                                       |
|-----------|---------------------------------------|
| Unchecked | No, the roadway is not an NBI roadway |
| Checked   | Yes, the roadway is an NBI roadway    |

## \*5C03 Position/Prefix - Is the Feature Intersected On or Under the Bridge?

(Old BMS Items B04, B01, PB09, R02)

### 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.

### Coding:

- "X" Route on  
"X" Route under

### Examples:

A bridge carrying SR 1206 with a single route, SR 2090 passing under it:

| Roadway Name | On/Under           |
|--------------|--------------------|
| SR 1206      | Route On Structure |
| SR 2090      | 1st Route Under    |

A bridge carrying SR 3001 with routes, SR 1018 and SR 3018 passing under it:

|         |                             |
|---------|-----------------------------|
| SR 3001 | Route On Structure          |
| SR 1018 | 1 <sup>st</sup> Route Under |
| SR 3018 | 2 <sup>nd</sup> Route Under |

A tunnel with SR 0276 passing through it:

|         |                             |
|---------|-----------------------------|
| Tunnel  | Route On Structure          |
| SR 0276 | 1 <sup>st</sup> Route Under |

## \*5C04 Kind Hwy (Rte Pref) - Route Signing Prefix

(Old BMS Items B07 and R03)

### Description:

This item indicates the kind of highway of the FEATURE.

### Procedure:

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

(Old BMS Item B08)

### 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

(Old BMS Items B05, B06, R03)

### 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:

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 No applicable (non-highway related features)

**5C07 Critical Facility**

(Old BMS Item A28)

**Description:**

This item indicates whether or not the bridge is a critical facility.

**Procedure:**

Leave this item blank. The Department submits this data to the FHWA based on traffic route.

**\*5C08 Lanes, Medians, Speed - Lanes On and Under the Structure / Medians on Structure / Speed**

(Old BMS Items B34 and B11)

**Description:**

This series of three fields is used to record the number of through traffic lanes on and under the structure, the number of medians on the structure, and the actual or posed speed of the roadway

**Procedure:**

Code the number of through 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).

When the inventory route is "on" the bridge, code the sum of the total number of lanes on all inventoried routes under the bridge. If separate RMS numbers exist for directional highways,(e.g. Rte 15 SB, Rte 15 NB) they are treated as separate inventory routes, and the directional highways must be entered separately for lanes "on" even though they may be on the same structure. The same process would be followed for lanes "under".

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 "00" if there are no highway lanes on the obstructing structure.

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.

### Coding and Examples:

#### Field 1

1 lane on

|   |
|---|
| 1 |
|---|

3 lanes under

|   |
|---|
| 3 |
|---|

5 lanes on double deck each direction\*

|    |
|----|
| 10 |
|----|

5 lanes on double deck each direction \*\*

|    |
|----|
| 05 |
|----|

Railroad and pedestrian on

|    |
|----|
| 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

### 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 (Old BMS Items B27 and R04)

### Description:

This item is used to record the “current” average annual daily 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. If this information is not available, a best estimate is recommended.

### Coding:

Number of vehicles per day.

## \*5C11 Year - Year of Average Daily Traffic (Old BMS Items B28 and R05)

### Description:

This item is used to record the “current” year of the ADT.

### 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 4 digit year of the average annual daily traffic.

## 5C12 Future ADT - Future Average Daily Traffic (Old BMS Items F10)

### Description:

This item is used to record the forecasted average daily traffic (ADT) for the inventory route. This 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).

### 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 future average daily traffic, in vehicles per day.

## 5C13 Year - Year of Future Average Daily Traffic

(Old BMS Items F11)

### Description:

This item is used to record the year of the future ADT in item 5C12. 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.

### 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 4 digit year of future average daily traffic.

## \*5C14 Truck %ADT - Average Daily Truck Traffic (Percent)

(Old BMS Items B30-A and R07-A)

### Description:

This is a 2 digit field used to indicate the percentage of ADT that is truck traffic.

### Procedure:

Enter the percentage of ADT that is truck traffic **This item will be automatically entered for state routes inventoried in 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

(Old BMS Item A35)

### 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.

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.

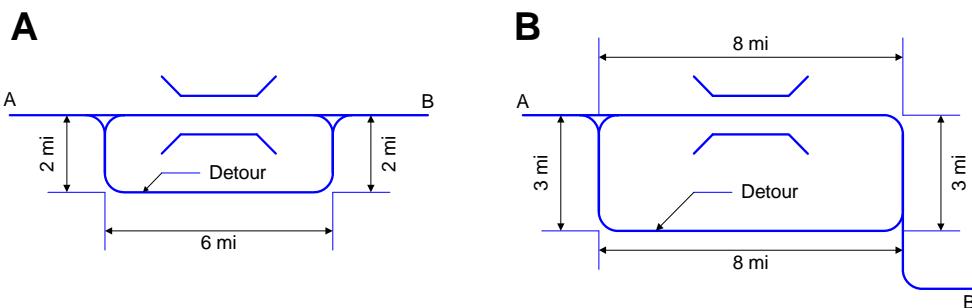
Enter this item for each bridge that carries highway traffic.

### 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. | <input type="text" value="1.00"/>  |
| Detour Figure A, 4 mile additional travel length                                                 | <input type="text" value="4.00"/>  |
| Bridge over river, 121 mile additional travel                                                    | <input type="text" value="99.00"/> |
| Detour Figure B, 0 mile additional travel length                                                 | <input type="text" value="0.00"/>  |



## 5C16 Speed - Detour Speed

### 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

### 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

### 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.

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

### Description:

This item indicates whether or not the inventory rout is on the Base Network.

### Procedure:

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.

**Leave this item blank until the Department provides further clarification.**

## 5C20 LRS Inventory Rte, Sub# - LRS Inventory Route and Subroute Number

### 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**

(Old BMS Item A25)

**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:**

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                                     |
| Blank | Not Applicable                                                                                                                                  |

**\*5C22 Functional Class - Functional Classification**

(Old BMS Items B18 and R10)

**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.

For state routes, this item will be automatically entered by the system based on data it obtains from RMS.

For features other than a highway, such as a railroad, pedestrian, cattle crossing, etc., code "NN" for not applicable.

### 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                                            |

## 5C23 Traffic Direction

### Description:

This item is used to indicate the direction of traffic of the route identified.

### Procedure:

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)

(Old BMS Item B23)

### 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

### 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

(Old BMS Item A30)

### 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.

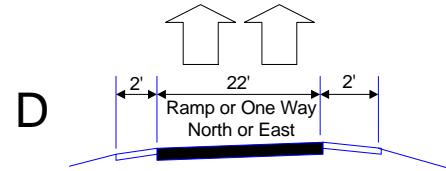
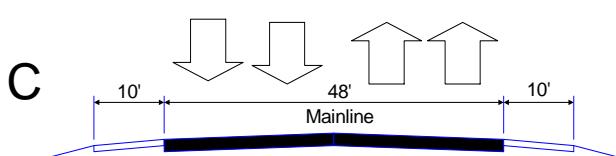
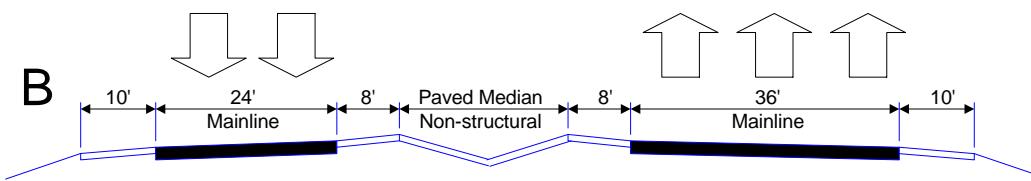
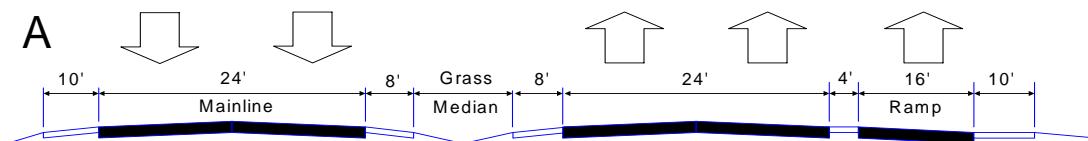
- (1) The most restrictive approach produces the largest algebraic difference between 5C26 and 5C27 (bridge roadway width c/c).

**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 (Old BMS Item A31)

**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.

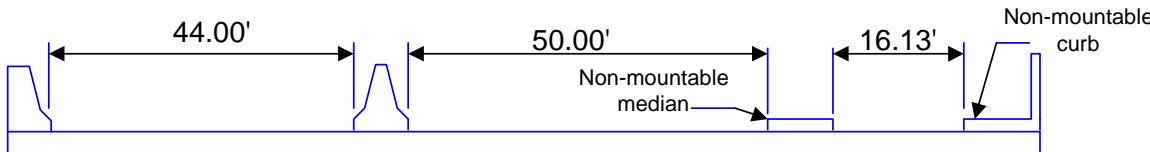
### Coding:

Curb to curb width to the nearest tenth foot.

#### Examples:

| <u>Bridge Roadway Width</u> |         |
|-----------------------------|---------|
| 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

(Old BMS Item B24)

### Description:

This item is used to indicate strategic highway network (STRAHNET) conditions.

### Procedure:

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

## \*5C29 Nat. Hwy Sys - National Highway System

(Old BMS Item B17-A)

### Description:

This item indicates the National Highway System (NHS) of the inventory route. This item is required to be coded for all state and local routes.

This data will be automatically input from RMS and should be confirmed.

**Procedure:**

For the route being described, indicate whether the route is on the National Highway System by using the codes below.

**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**

(Old BMS Item A18)

**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****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**

(Old BMS Item A19)

**Description:**

This checkbox field indicates whether or not the route is used by public transit such as local or long distance scheduled buses or trolleys, etc.

**Procedure:**

If the route is used by public transit, the box should be checked. If the route is not used by public transit, the box should be unchecked.

**Coding:**

- |           |                                         |
|-----------|-----------------------------------------|
| Unchecked | The route is not used by public transit |
| Checked   | The route is used by public transit     |

**\*5C33 Nat Truck Network - National Truck Network**

(Old BMS Item B19-A)

**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:**

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 <b>is not</b> part of the national network for trucks |
| 1 | The inventory route <b>is</b> part of the national network for trucks     |

**5C34 Emer - Emergency Indicator****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 Agency Roadway 1****Description:**

This item is reserved for future use.

## **5C36 Agency Roadway 2**

### **Description:**

This item is reserved for future use.

## **5C37 Agency Roadway 3**

### **Description:**

This item is reserved for future use.

## **5C38 Agency Roadway 4**

### **Description:**

This item is reserved for future use.

## **5C39 Agency Roadway 5**

### **Description:**

This item is 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

| Unit Key | Type | Unit ID | Default | Description |
|----------|------|---------|---------|-------------|
|          |      |         |         |             |

**Structure Unit Information:**

5D01 Unit Key:  5D03 Structure Unit Description:   
 5D02 Unit ID:  5D04 Type:   
 5D05 Default Bridge Unit:

### 5D01 Unit Key

#### Description:

This display only item indicates the structure unit key for the unit.

#### Procedure:

This item is used internally by the system and required no input from the bridge inspector.

## 5D02 Unit ID - Structure Unit ID

(Old BMS items PA04, J09, W09)

### 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 Applet, Underwater tab.

### 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  
WFR 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

### Note:

Use abutment and pier codes to locate scour inside of single and multi-cell culverts without floors.

## 5D03 Structure Unit Description

### 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**

(Old BMS Items J09 and PA07)

**Description:**

This item is used to indicate the type of structure unit.

**Procedure:**

Select the appropriate structure unit type from the dropdown list.

**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
- 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****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     |

## 5E Inspection Inventory - Classification

The Inspection Inventory - Classification Screen describes the bridge classification and allows user defined fields for the Agency.

**Classification Information:**

- 5E01 NBIS Bridge Len: [dropdown]
- 5E02 Parallel Structure: [dropdown]
- 5E03 Temporary Struct: [dropdown]
- 5E04 Hist Significance: [dropdown]
- 5E05 Frac Crit Details: [dropdown]

**System:**

- 5E06 Formulas Trigger:
- 5E07 Simulation Trace:
- 5E08 Apply Imp Policy:
- 5E09 SR Calculate Status: [dropdown]

**Agency Bridge Items:**

|                      |          |
|----------------------|----------|
| 5E10 ACM Status:     | 5E18 9.  |
| 5E11 IR:             | 5E19 10. |
| 5E12 IC:             | 5E20 11. |
| 5E13 ACM Insp Date:  | 5E21 12. |
| 5E14 ACM Qty:        | 5E22 13. |
| 5E15 ACM Num Loc:    | 5E23 14. |
| 5E16 ACM Loc Desc 1: | 5E24 15. |
| 5E17 ACM Loc Desc 2: |          |

**Created on:**      **Last Updated:**  
**Created by:**      **Updated by:**

### 5E01 NBIS Bridge Len - NBIS Bridge Length

(Old BMS Item C07-A)

#### 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."

#### Note:

The NBIS length is not necessarily the same length as the structure length (Item 5B18).

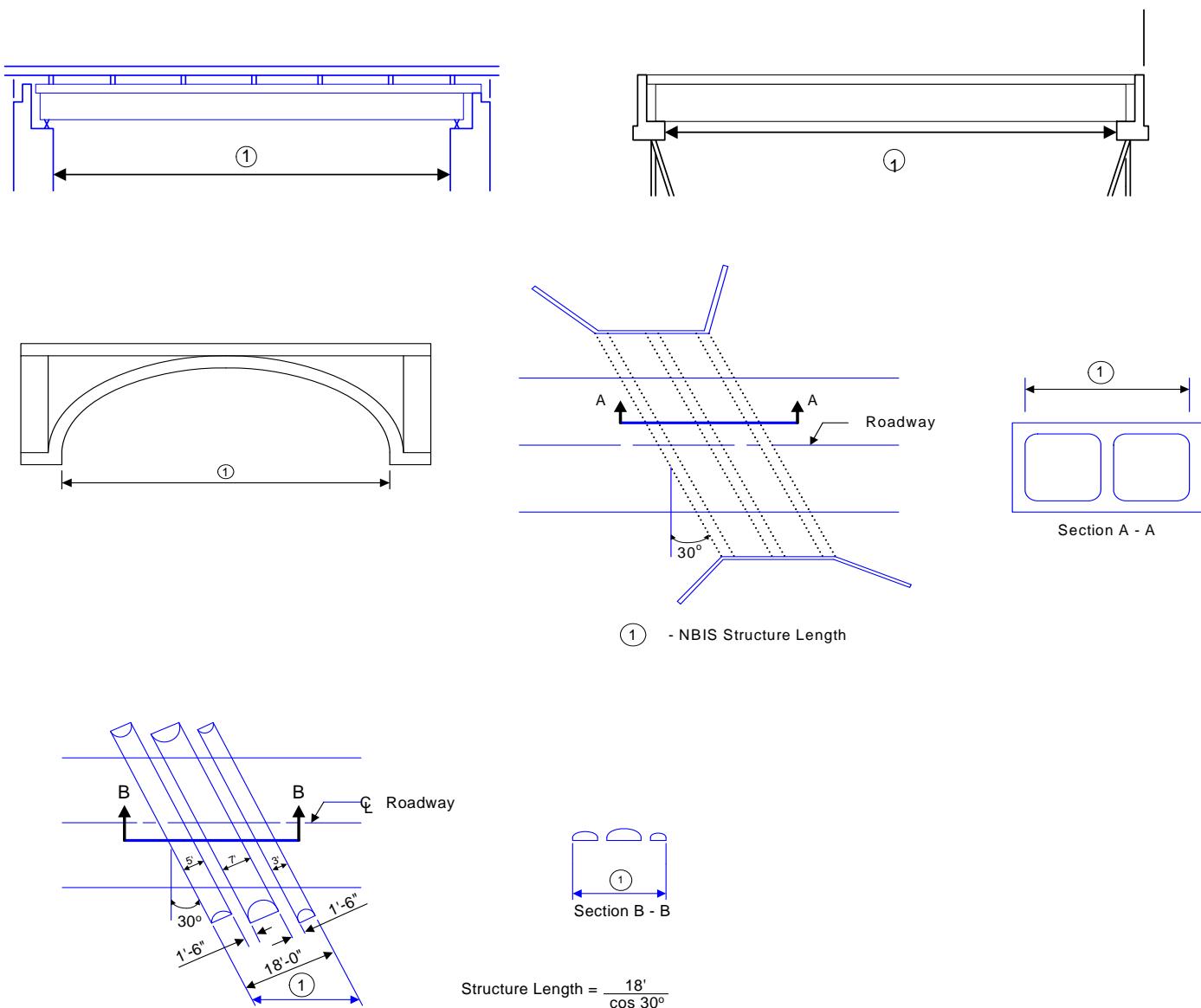
**Procedure:**

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

Code "N" for sign structures, high mast lights, retaining walls and noise walls.



## 5E02 Parallel Structure

(Old BMS item B10)

### 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

(Old BMS Item A27)

### 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

(Old BMS Item C01)

### 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:

Select the appropriate code from the dropdown list.

### 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 historic register
- 4      Historical significance is not determinable at this time.
- 5      Bridge is not eligible for the National Register of Historic Places

## 5E05 to 5E09

### Description:

**Do not enter information in these fields at this time. The Department will provide further clarification.**

## 5E10 ACM Status - Asbestos Containing Material (ACM) Status

### Description:

This item is a temporary field 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

**Description:**

This item is a temporary field 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

**Description:**

This item is a temporary field 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

**Description:**

This item is a temporary field 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

### Description:

This item is a temporary field 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

### Description:

This item is a temporary field 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

### Description:

This field is a temporary field 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

## 5E18-5E24 Agency Bridge Items

These items are reserved for future use

## 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.

To access and update Agency Bridge information for a particular structure:

1. From the Pontis desktop, select the structure from the list, and double click on it.
2. The Inspection Tab card for the most recent inspection for the selected structure will appear by default.
3. Access the Agency Bridge screen by clicking on the 6 Agency tab and then selecting the 1 Bridge vertical tab.
4. Check that the system is in Edit Mode in order to modify the data.
5. After modifying the data, click Save button on the top of the screen to update data to the database.

The user can select a different bridge on the Inspection Tab Card by selecting the bridge from the Bridge Field dropdown list on the top of the screen.

**General**

|                                               |                                           |                                                  |                                                  |                                             |
|-----------------------------------------------|-------------------------------------------|--------------------------------------------------|--------------------------------------------------|---------------------------------------------|
| 6A01 Senat Dist: 47                           | 6A02 Cong Dist: 04                        | 6A03 Leg Dist: 015                               | 6A04 Bndy: N - None                              | 6A05 Util Present: <input type="checkbox"/> |
| 6A06 Sub Agncy: D11 - Di                      | 6A07 Fed Fund: <input type="text"/>       | 6A08 Dept Struc Len: <input type="text"/> ft     | 6A09 Critical Facility: <input type="checkbox"/> |                                             |
| 6A10 Flood Insp: <input type="checkbox"/>     | 6A11 Covr Brdg: <input type="checkbox"/>  | 6A12 Dem/Repl Ind: <input type="checkbox"/>      | 6A13 Dem/Repl Dt: <input type="text"/>           |                                             |
| 6A14 Hist Dist Cont: <input type="checkbox"/> | 6A15 Hist Dist: <input type="text"/>      | 6A16 Preserv Candidate: <input type="checkbox"/> | 6A17 Future Brdg Bill: <input type="checkbox"/>  |                                             |
| 6A18 Network: <input type="text"/>            | 6A19 Bus Plan Nth: 3 - Non-NHS/ADT > 2000 | 6A20 Watershed: <input type="text"/>             | 6A21 Deice Equip: <input type="text"/>           | 6A22 Corridor: <input type="text"/>         |
| 6A23 Owner Desc: PADOT                        | 6A24 Trnback Desc: <input type="text"/>   |                                                  |                                                  |                                             |

**Structure Type**

| Main                                       | Approach                 |
|--------------------------------------------|--------------------------|
| 5B(12,13,15,16) FHWA: - Concrete - Culvert | - Other - Other (NBI)    |
| 6A26 Material: 2 - Concrete(in place)      | <input type="checkbox"/> |
| 6A27 Physical: 1 - Reinforced              | <input type="checkbox"/> |
| 6A28 Span Interact: 9 - Other              | <input type="checkbox"/> |
| 6A29 Struct Config: 31 - Box culvert       | <input type="checkbox"/> |

**Deck Wearing Surface Info**

| Main                                                  | Approach                                |
|-------------------------------------------------------|-----------------------------------------|
| 5B02 / 6A30 Surf: N - N/A (no deck (NBI))             | - Unknown (NBI)                         |
| 5B03 / 6A31 Memb: N - N/A (no deck (NBI))             | <input type="checkbox"/>                |
| 5B04 / 6A32 Protect: N - N/A (no deck (NBI))          | <input type="checkbox"/>                |
| 6A33 Thickness: .0 in                                 | . in                                    |
| 6A34 Dt Recorded: 01/01/1901                          | 01/01/1901                              |
| 6A35 Surf Thick (Over/Under): <input type="text"/> in | 6A36 Protect Year: <input type="text"/> |
| 6A37 Protect Note: <input type="text"/>               |                                         |

**Deck Info**

|                                       |                                             |
|---------------------------------------|---------------------------------------------|
| 6A38 Dept StrucTyp: 01 - Under fill   | 6A39 Relief Joint: <input type="checkbox"/> |
| 6A40 Form Type: <input type="text"/>  | 6A41 No of Joints: <input type="text"/>     |
| 6A42 Rebar Type: <input type="text"/> | 6A43 Appr Pav Width: 52 ft                  |

**Latent Problem**

|                                      |                                      |
|--------------------------------------|--------------------------------------|
| 6A50 Sup Struc: <input type="text"/> | 6A51 Sub Struc: <input type="text"/> |
|--------------------------------------|--------------------------------------|

**Est Truck Traffic**

|                     |                                 |
|---------------------|---------------------------------|
| 6A52 Traffic: -1    | 5A16 Year: <input type="text"/> |
| 6A53 Fatig Life: -1 | 6A55 Deck Recon: 0              |
| 6A54 Year: -1       | 6A56 Super Recon: 0             |
|                     | 6A57 Sub Recon: 0               |

**Reconstruction Work**

**Fracture Critical**

| Main                         | Approach                 |
|------------------------------|--------------------------|
| 6A44 Group No: 9 - Group 9   | <input type="checkbox"/> |
| 6A45 Mem_type: 9 - Non-Steel | <input type="checkbox"/> |
| 6A46 Fatig Sus: 9 -          | <input type="checkbox"/> |
| 6A47 Material: 9 -           | <input type="checkbox"/> |
| 6A48 Adtt: 3 - low           | <input type="checkbox"/> |
| 6A49 Total Crf: 30           | <input type="checkbox"/> |

## 6A01 Senat Dist - State Senatorial District

(Old BMS items A02 and R13)

### Description:

This two part item specifies the Senatorial District Number for the bridge.

### Procedure:

For state routes, this item will be automatically entered by the System based on data that it obtains from RMS.

### 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).

## 6A02 Cong Dist - United States Congressional District

(Old BMS items A03 and R14)

### Description:

This two part item specifies the United States Congressional District Number assigned to the geographic area in which the bridge resides.

### Procedure:

For state routes, this item will be automatically entered by the System based on data that it obtains from RMS.

### 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).

## 6A03 Leg Dist - Legislative District

(Old BMS items A04 and R15)

### Description:

This two part item specifies the Legislative District Number for the bridge.

### Procedure:

For state routes, this item will be automatically entered by the System based on data that it obtains from RMS.

### 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).

## 6A04 Bndy - County or Municipal Boundary Intersecting Bridge

(Old BMS item A10)

**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

(Old BMS item C34)

**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 Agncy - Agency Submitting Structure Inventory Record

(Old BMS item A05)

**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, page 3-395                           |     |                                        |
| PTC                                   | Pennsylvania Turnpike Commission                         | DOE | PA Department of Education             |
| 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 DCNR | NYS | New York DOT                           |
| DGS                                   | PA Department of General Services                        | FWH | Federal Agency                         |
| DOH                                   | PA Department of Health                                  | OPA | Other Private Agency                   |
| DPW                                   | PA Department of Public Welfare                          | OTH | Other Agency                           |

**6A07 Fed Fund - Federal Funding Code**

(Old BMS item A12)

**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 Dept Struc Len - Total Length of the Structure**

(Old BMS item C07)

**Description:**

This item is used to record the total overall length of the structure.

**Procedure:**

No entry need in this item since the data is the same as entered for 5B18.

**\*6A09 Critical Facility**

(Old BMS item A28)

**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**

(Old BMS item E02-A)

**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 Covr Brdge - Covered Bridge Indicator**

(Old BMS item C01-A)

**Description:**

This checkbox field indicates whether or not the bridge is a covered timber bridge.

**Procedure:**

Check or uncheck box to indicate the appropriate code.

**Coding:**

- Checked      Yes, the bridge is a covered bridge  
Unchecked    No, the bridge is not a covered bridge

**6A12 Dem/Repl Ind - Demolished and Replaced Indicator****Description:**

This checkbox field indicates whether or not the bridge was demolished.

**Procedure:**

Check or uncheck box to indicate the appropriate code. This item must be checked for a bridge that has been demolished.

**Coding:**

Checked      Bridge has been demolished  
Unchecked    Bridge has not been demolished

**6A13 Dem/Repl Dt - Demolished and Replaced Date****Description:**

This item is used to record the date on which the bridge was demolished and replaced.

**Procedure:**

Enter the date on which the bridge was demolished and 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****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****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****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 Brdg Bill - Future Bridge Bill Candidate Indicator****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****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:**

N/A

## 6A19 Bus Plan Ntk - Business Plan Network

(Old BMS item B35)

**Description:**

This item indicates the Business Plan Network of the highway feature being described.

**Procedure:**

Select the appropriate code from the dropdown list.

**Coding:**

- 1 Interstate Routes and Ramps
- 2 Other NHS Routes (Non-Interstate)
- 3 Non-NHS Routes with ADT > 2000
- 4 Other Non-NHS Routes
- D DCNR Bridges
- L Local network
- N Walls and Signs
- T Turnpike

## 6A20 Watershed - Watershed Name

**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:**

N/A

## 6A21 Deice Equip - Deicing Equipment Description

**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)

## 6A22 Corridor

### Description:

This item is used to record the corridor within which the structure is located.  
This item is reserved for future use.

## 6A23 Owner Desc - Owner Description

(Old BMS item A20)

### 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

### 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

## \*6A26 Material - Material Used for Main Unit, Approach Unit, Sign Structure and Walls (Department)

(Old BMS items C05, S13 and T08)

### 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)**

(Old BMS items C05, S13 and T08)

**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)

(Old BMS items C05, S13 and T08)

### 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

(Old BMS items C05, S13 and T08)

### 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.

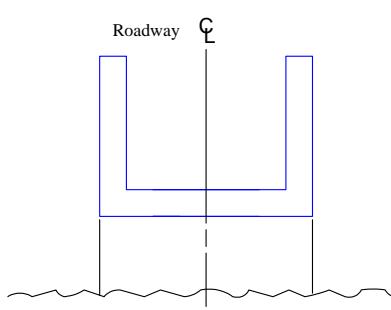
## Coding:

### Bridges and Culverts:

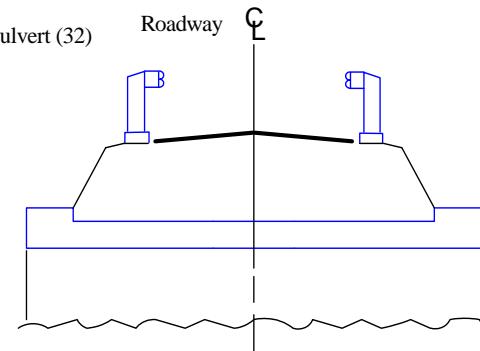
- |    |                                                                                                                                            |    |                                |
|----|--------------------------------------------------------------------------------------------------------------------------------------------|----|--------------------------------|
| 01 | Slab or slab beams (solid)                                                                                                                 | 19 | *Arch - deck - open spandrel   |
| 02 | Slab or slab beams (hollow)                                                                                                                | 20 | *Arch - deck - closed spandrel |
| 03 | T-beams - single or multiple                                                                                                               | 21 | *Arch - thru                   |
| 04 | I beams (include rolled wide flange beams with<br>or without cover plate or prestressed concrete I<br>beams) - single or multiple (spread) | 22 | Rigid frame                    |
| 05 | Box beam - single                                                                                                                          | 23 | Orthotropic                    |
| 06 | Box beam - multiple (spread)                                                                                                               | 24 | Suspension                     |
| 07 | Box beam - adjacent                                                                                                                        | 25 | Stayed girder                  |
| 08 | Channel beams                                                                                                                              | 26 | Movable - lift                 |
| 09 | I-welded beams - single or multiple                                                                                                        | 27 | Movable - bascule              |
| 10 | I-riveted beams - single or multiple                                                                                                       | 28 | Movable - swing                |
| 11 | Girder/floorbeam system, welded - deck                                                                                                     | 29 | Tunnel                         |
| 12 | Girder/floorbeam system, welded - thru                                                                                                     | 30 | Frame culvert                  |
| 13 | Girder/floorbeam system, riveted - deck                                                                                                    | 31 | **Box culvert                  |
| 14 | Girder/floorbeam system, riveted - thru                                                                                                    | 32 | *Arch culvert                  |
| 15 | Girder/floorbeam system, welded with overhang<br>bracket - deck                                                                            | 33 | Tied arch culvert              |
| 16 | Girder/floorbeam system, riveted with overhang<br>bracket - deck                                                                           | 34 | Pipe culvert                   |
| 17 | Truss - deck                                                                                                                               | 35 | Pipe - arch culvert            |
| 18 | Truss - thru                                                                                                                               | 36 | Solid timber beams             |
|    |                                                                                                                                            | 37 | Glue-laminated timber beams    |
|    |                                                                                                                                            | 38 | Stressed timber                |
|    |                                                                                                                                            | 52 | Segmental box girder           |
|    |                                                                                                                                            | 99 | Other                          |

\*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).

Closed Spandrel Deck Arch (20)



Arch Culvert (32)



\*\*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 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.

**Sign Structures and High Mast Lights:**

|    |               |    |                                            |
|----|---------------|----|--------------------------------------------|
| 39 | Cantilever    | 43 | Overhead Structural Shape or Tube          |
| 40 | 2 Chord Truss | 44 | Overhead Truss with Multiple Spans         |
| 41 | 3 Chord Truss | 45 | Structure Mounted Sign (Old BMS code - 99) |
| 42 | 4 Chord Truss | 46 | High Mast Light                            |

**Walls:**

| BMS2 | Old BMS | Description                              | BMS2 | Old BMS | Description                        |
|------|---------|------------------------------------------|------|---------|------------------------------------|
| 61   | 01      | Cantilever                               | 69   | 09      | Doublewall (concrete modular wall) |
| 62   | 02      | Counterfort                              | 70   | 10      | Flexible Non-Anchored Wall         |
| 63   | 03      | Cribbing                                 | 71   | 11      | Flexible Anchored Wall             |
| 64   | 04      | Gabion                                   | 72   | 12      | Concrete Modular Wall              |
| 65   | 05      | Mechanically Stabilized Embankment (MSE) | 73   | 20      | Post and Panel Noise Wall          |
| 66   | 06      | Tied Back                                | 74   | 21      | Offset Noise Barrier               |
| 67   | 07      | Reinforced Earth (MSE)                   | 75   | 22      | Offset Noise Barrier - Fan Wall    |
| 68   | 08      | VSL Retained Earth (MSE)                 | 76   | 99      | Other Wall                         |

If a combination of types exist, code the most critical one.

**Note:**

Underscoring denotes a proprietary product.

**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 (Old BMS item C10)

### 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 | 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 (Old BMS item C10)

### 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 (Old BMS item C10)

### 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. Roshphalt 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**  
(Old BMS item C10-A)**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.

**6A34 Dt Recorded - Date Wearing Surface Thickness for Main and Approach Units was Recorded****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

### Description:

This two part item is used to record average surface thickness over and under the membrane.

### Procedure:

In the 1<sup>st</sup> field, enter the average surface thickness over the membrane to the nearest tenth of an inch, if applicable.

In the 2<sup>nd</sup> 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

### 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

### 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 Struct Typ - Bridge Deck Type

(Old BMS item C09)

### 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)                         |
|    |                                                                                                                                                                            | 99 | Other                                                  |

**6A39 Relief Joint - Are There Pavement Relief Joints?**

(Old BMS item C19)

**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**

(Old BMS item C20)

**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**

(Old BMS item C19-A)

**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 deck joints on the deck, code "0" (i.e., a prestressed box beam).

**Note:**

This item should include the number of expansion devices on the bridge. (Applicable joint types VD25 Exp JT Types, D thru N). Construction joints or longitudinal joints should not be included.

**6A42 Rebar Type - Type of Deck Reinforcement Bar Protection**

(Old BMS item C21)

**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**

(Old BMS item A29)

**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**

(Old BMS items C18, J02, J06)

**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 Ass'y. Plus Girder Tension Zone                           |
|       | Truss Bridge                                                                                                   |                                                                            |
|       | with Simple Span                                                                                               | Tension Member (including Eye Bar if 2 or less)                            |
|       | with Suspended Span                                                                                            | Suspended Hanger Ass'y. 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 |
|       | Suspended Span                                                                                                 | Suspended Hanger Assembly                                                  |
|       | Simple/Continuous Span                                                                                         | 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     | Reserved                                                                                                       |                                                                            |
| 8     | Reserved                                                                                                       |                                                                            |
| 9     | All other Non-Steel Bridges<br>(Concrete, P/S Concrete, Timber, P.P. Culverts, etc.)                           |                                                                            |

**Note:**

Refer to Pub. 238, Section IP 2.4.4, Classification of Fracture Critical Members, for further information on coding items 6A44-6A48.

## 6A45 Mem\_type - Critical Rating Factor Type of Member for Main Unit and Approach Spans

(Old BMS items C18-A and J03)

### 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 apply, use the lowest value. For additional information on this coding, refer to Pub. 238, Section IP 2.4, Fatigue and Fracture Inspections. This manual identifies Groups 0-3 only for CRF computation.

### 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 Rating Factor Fatigue Susceptibility for Main Unit and Approach Spans

(Old BMS items C18-A and J03)

### 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 apply, use the lowest value. For additional information on this coding, refer to Pub. 238, Section IP 2.4, Fatigue and Fracture Inspections. This manual identifies Groups 0-3 only for CRF computation.

**Coding:**

| Type of Member                            | Fatigue Crack Susceptibility (2)                |             |
|-------------------------------------------|-------------------------------------------------|-------------|
| Intersecting Welds                        | 0                                               |             |
| Suspended Assembly                        | 0                                               |             |
| Welded, Direct Tension                    | AASHTO<br><u>Stress Category</u>                | <u>Code</u> |
|                                           | E' (1)                                          | 1           |
| Welded, Bending                           | E                                               | 2           |
|                                           | D                                               | 3           |
| Riveted/Bolted Rolled Sections            | C & C'                                          | 4           |
| Tack Welding                              | B & B'                                          | 5           |
| Welded Connection Plates                  | A                                               | 6           |
|                                           | (1) Includes Out of Plane Bending Details       |             |
| Riveted/Bolted Rolled Sections No Welding | Out of Plane Bending Detail code 1, else code 8 |             |
| Non-Steel Bridges                         | 9                                               |             |

(2) Fatigue crack susceptibility is not dependent upon AASHTO stress category detail alone but also upon the actual stress range.

## 6A47 Material - Critical Rating Factor Material for Main Unit and Approach Spans

(Old BMS items C18-A and J03)

**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 apply, use the lowest value. For additional information on this coding, refer to Pub. 238, Section IP 2.4, Fatigue and Fracture Inspections. This manual identifies Groups 0-3 only for CRF computation.

**Coding:**

| Type of Member                            | Material                       |                        |             |
|-------------------------------------------|--------------------------------|------------------------|-------------|
| Intersecting Welds                        | 0                              |                        |             |
| Suspended Assembly                        | 0                              |                        |             |
| Welded,<br>Direct Tension                 | Weldable Steel<br><u>Grade</u> | CVN<br>At<br>+40°<br>F | <u>Code</u> |
| Welded, Bending                           | No                             | <15                    | 1           |
| Riveted/Bolted<br>Rolled Sections         | No                             | >15                    | 2           |
| Tack Welding                              | Yes                            | <15                    | 3           |
| Welded Connection Plates                  | Yes                            | >15                    | 4           |
|                                           | * If CVN not known, assume <15 |                        |             |
| Riveted/Bolted Rolled Sections No Welding | 8                              |                        |             |
| Non-Steel Bridges                         | 9                              |                        |             |

## 6A48 Adtt - Critical Rating Factor Cumulative Truck Traffic for Main Unit and Approach Spans

(Old BMS items C18-A and J03)

### 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 apply, use the lowest value. For additional information on this coding, refer to refer to Pub. 238, Section IP 2.4, Fatigue and Fracture Inspections. This manual identifies Groups 0-3 only for CRF computation.

### Coding:

| Type of Member                                                                | Cumulative Truck Traffic                                                                   |             |
|-------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|-------------|
| Intersecting Welds                                                            | 1                                                                                          |             |
| Suspended Assembly                                                            | <u>ADTT</u>                                                                                | <u>Code</u> |
| Welded,<br>Direct Tension                                                     | High >2000<br>Medium<br>Low <1000                                                          | 1<br>2<br>3 |
| Welded, Bending                                                               | Use estimated remaining fatigue life to approximate the effect of cumulative truck traffic |             |
| Riveted/Bolted<br>Rolled Sections<br>Tack Welding<br>Welded Connection Plates | <u>Remaining<br/>Fatigue Life</u>                                                          | <u>Code</u> |
| Riveted/Bolted Rolled Sections No<br>Welding                                  | < 10 Years<br>11-20 Years<br>> 20 Years                                                    | 1<br>2<br>3 |
| Non-Steel Bridges <sup>(1)</sup>                                              |                                                                                            |             |

(1) Unless a fatigue analysis indicates a problem, a coding of "3" is appropriate for P/S concrete bridges.

## 6A49 Total CRF - Total FCM Criticality Ranking Factor for Main Unit and Approach Spans

(Old BMS items J04 and J08)

### Description:

This display only item is used to record the sum of the Main Fracture Criticality Ranking Factor. This information is automatically calculated by adding the 4 numeric values of the FCM Criticality Ranking Factor values.

### Procedure:

The system automatically adds the data from 6A45, 6A46, 6A47, and 6A48 to obtain a Main FCM CRF total.

**Coding:**

The 2 digit sum relating to the Main FCM CRF total.

**6A50 Sup Struc - Latent Problems in Bridge Superstructure**

(Old BMS items C25)

**Description:**

This item indicates the type of latent problems which exist in the bridge superstructure.

**Procedure:**

No matter how carefully a structure was designed, constructed and maintained, problems which may later affect the serviceability of the structure may be found during the inspection, repair or rehabilitation. Such problems in the superstructure unit may be generic, material, construction or bridge type systems related. If they are potential sources of significant trouble, they are termed "Latent Problems". Latent problems are not hazardous as long as they remain dormant. However, bridges identified as candidates for latent problems need attention. It is often necessary to inspect these bridges at intervals less than 2 years so that latent problems, when developed, will be detected. In the dormant stage, latent problems are difficult to include in the serviceability or sufficiency rating of a structure. For example, in steel structures, latent problems relate to fatigue prone details, such as welding to tension flange. In P/S concrete bridges, loss of prestress force due to hidden corrosion is a latent problem. Other problems are described in Inspection Alert letters. For example, in steel substructures, latent problems may relate to effects of corrosion on steel such as A588 or prestress tendons and rarely relate to fatigue prone details, sometimes due to pile related or flood related (scour) problems or other problems described in Inspection Alert letters. In some structures, latent problems remain dormant throughout the life of the structure, for example, structures having fatigue prone details but low volume traffic.

**Coding:**

This item is for future use and should be left blank. When "Latent Problems" are discovered during inspection, inform the Bureau of Design about the types of problems so that proper codings will be developed.

**6A51 Sub Struc - Latent Problems in Substructure**

(Old BMS items C43)

**Description:**

This item indicates the type of latent problems which exist in the bridge substructure.

**Procedure:**

No matter how carefully a structure was designed, constructed or maintained, problems, which may later affect the serviceability of the structure may be found during the inspection, repair or rehabilitation. Such problems in the substructure unit may be generic, material, construction or bridge type system related. If they are potential sources of significant trouble, they are termed "Latent Problems". Latent problems are not hazardous as long as they remain dormant. However, bridges identified as candidates for latent problems need attention. It is often necessary to inspect these bridges at intervals less than 2 years so that latent problems, when developed, will be detected. In the dormant stage, latent problems are difficult to include in the serviceability or sufficiency rating of a structure. For example in steel structures, latent problems relate to fatigue prone details, such as welding to tension flange. In P/S concrete bridges, loss of prestress force due to hidden corrosion is a latent problem. Other problems are described in Inspection Alert letters. In steel substructures, latent problems may

relate to effects of corrosion on steel such as A588 or prestressed tendons and rarely relate to fatigue prone details, sometimes due to pile or flood related (scour) problems or other problems described in Inspection Alert letters. In some structures, latent problems remain dormant throughout the life of the structure.

**Coding:**

This item is for future use and should be left blank. When "Latent Problems" are discovered during inspection, inform the Bureau of Design about the types of problems so that proper codings will be developed.

**6A52 Traffic - Estimated Cumulative Truck Traffic in Thousands**

(Old BMS items C14)

**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**

(Old BMS items C02)

**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**

(Old BMS items C15)

**Description:**

This item is used to record the month and year of the estimated cumulative truck traffic.  
This item is for future use.

**6A55 Recon Deck - Proposed Major Deck Reconstruction**

(Old BMS items A17, F02)

**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 Recon Super – Proposed Major Superstructure Reconstruction**

(Old BMS items A17, F02)

**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 Recon Sub – Proposed Major Substructure Reconstruction**

(Old BMS items A17, F02)

**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

## 6B Agency - Inspection

The Agency Inspection screen is used to enter agency-specific information associated with the inspection of a bridge. This information may be entered as part of a regular Pontis inspection.

To access and update Agency Inspection information for a particular structure:

1. From the Pontis desktop, select the structure from the list, and double click on it or click the New button to create a new inspection for the structure.
2. The Inspection Tab card for the most recent inspection for the selected structure will appear by default.
3. Access the Agency Bridge screen by clicking on the 6 Agency tab and then selecting the 2 Inspection vertical tab.
4. Check that the system is in Edit Mode in order to modify the data.
5. After modifying the data, click on to the Save button on the top of the screen to update the data to the database.

The user can select a different bridge on the Inspection Tab Card by selecting the bridge from the Bridge Field dropdown list on the top of the screen.

At the top of the screen is the Select Inspection section. It allows users to choose a specific structure inspection.

**Bridge Inspection Mode: Edit Type: R - Regular (routine) Key: 0011**

**Bridge:** [dropdown] **Find...** **Inspections (12):** [dropdown] **Metric** **English** **Reports...** **Save**

**1 CONDITION** **2 NOTES** **3 WORK** **4 APPRAISAL** **5 INVENTORY** **6 AGENCY** **7 SCHEDULE**

**1 Bridge** **2 Inspections** **3 Roadways** **4 Structure Units**

**6B01 Spc Insp Type:** [dropdown] **6B02 New Wear Surf Ind:**  **6B03 Inventory Correction Ind:**   
**6B04 Bump at Bridge Indicator:**  **6B05 Deck Overlay Meas Dt:** [dropdown] **6B06 Utility Repair Ind:**   
**6B07 Est. Spall Delam %:** [dropdown] **6B08 Est. Spall Delam Dt:** [dropdown] **6B09 Weather:** [dropdown]  
**6B10 Est. Spall Chloride %:** [dropdown] **6B11 Est. Spall Chloride Dt:** [dropdown] **6B12 Temperature:** [dropdown]  
**6B13 Under Cont Vert:** [dropdown] **6B14 Deck Geom Appr Tbl:** [dropdown] **6B15 Design Excpt:** [dropdown]

**Struc Cond / Load Cap Appraisal:**  
**6B16 Appr Based on:** [dropdown] **6B17 ADT:** [dropdown] **6B18 Inventory Rating:** [dropdown]  
**6B19 Cap Appr Cntrl:** [dropdown]

**Inspection Team:**  
**7A02 Team Leader:** [dropdown] **7A04 Inspected By:** [dropdown]  
**6B23 Member:** [dropdown] **6B24 Hired By:** [dropdown] **6B25 Insp Contract Num:** [dropdown]

**Inspection Hrs (Actual)**  
**6B26 NBI Crew:** [dropdown] **6B27 Crane:** [dropdown] **6B32 Engineer:** [dropdown]  
**6B28 Frac Crit:** [dropdown] **6B29 Other 1:** [dropdown] **6B33 Rigging:** [dropdown]  
**6B30 UWATER:** [dropdown] **6B31 Other 2:** [dropdown] **6B34 Office:** [dropdown] **6B35 New Paint Since Last Insp:**   
**6B36 Paint:** [dropdown] **6B37 Paint (Extent):** [dropdown]

**Paint Info:**

**Condition Rating:**  
**6B38 Appr Slab:** [dropdown] **6B41 Fund Rehab Elig:** [dropdown]  
**6B39 Appr Roadway:** [dropdown] **6B42 S1:** [dropdown] **6B43 S2:** [dropdown] **6B44 S3:** [dropdown] **6B45 S4:** [dropdown]  
**6B40 Deck Wear Surf:** [dropdown] **4A13 Suff Rating:** [dropdown] **6B46 Deficiency Rating:** [dropdown]

## \*6B01 Spc Insp Type - Type of Special Inspection That Is Needed (Old BMS item E04)

### Description:

This item is used to record the type of special inspection that is needed before the next bridge inspection.

### 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

## 6B02 New Wear Surf Ind - New Wearing Surface Under the Bridge Indicator

### 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

### 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 Indicator

### 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

**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

**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

**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****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****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****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****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****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****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 lesser value from 6C20 and 6C21.

**Coding:**

Controlling vertical underclearance to the nearest tenth of a foot.

## 6B14 Deck Geom Appr Tbl - Table Used for Deck Geometry Appraisal

### 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 Design Excpt - Design Exception

### Description:

Do not use this item. See item VN01 for Design Exception.

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

### Description:

This item is used to indicate if Table 1 was used to determine the value for Item 4A09.

### Procedure:

Select the appropriate code from the dropdown list to indicate if Table 1 was used.

### Coding:

0      Table 1 not used for Item 4A09.

1      Table 1 used for Item 4A09.

## 6B17 ADT - Average Daily Traffic

### 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

**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

**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

(Old BMS Item S02-A)

**Description:**

This item is used to indicate the next inspection type required for the structure.

**Procedure:**

Select the type of inspection required next for the structure from the dropdown list.

**Coding:**

| <b>6B20</b> | Type                    | 24 month<br>NBI Insp.<br>Interval | < 24 month<br>NBI Insp.<br>Interval | Comments                                                                                                                                                                                                |
|-------------|-------------------------|-----------------------------------|-------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A           | Access Equipment Only   | No                                | No                                  | Follow-up with access equipment (e.g. crane, lift, rigging) to complete inspection of remote bridge elements                                                                                            |
| B           | Damage                  | No                                | No                                  | Not a full NBIS Inspection – limited to damaged elements. An inspection crane may be used.                                                                                                              |
| C           | Routine Using Crane     | Yes                               | Yes                                 | NBIS. A complete routine NBIS inspection where the inspection crane is utilized.                                                                                                                        |
| D           | In-Depth                | No                                | No                                  | If In-Depth inspection scope meets/exceeds requirements for Routine inspection, code "R". For in-depth inspections scoped for critical areas only, code "D". An inspection crane may be used.           |
| E           | Element Inventory Only  | No                                | No                                  | Inventory of element level data only.                                                                                                                                                                   |
| F           | Initial (First Time)    | Yes                               | N/A                                 | NBIS. For 8' – 20' bridges also.                                                                                                                                                                        |
| G           | Fracture Critical       | No                                | No                                  | <b>Do Not Use</b> Historical information only for code identification from superseded BMS AJ screen.                                                                                                    |
| H           | Highway Environs Only   | Yes                               | N/A                                 | Inspection of non-highway bridges/structures over highways. Inspection limited to highway environs.                                                                                                     |
| I           | Interim (Special)       | No                                | Yes                                 | For 8' – 20' bridges also. Not a complete NBIS inspection. A special inspection limited to critical areas to meet reduced inspection interval. Otherwise use 7A03 = P. An inspection crane may be used. |
| M           | Miscellaneous           | Yes                               | Yes                                 | NBIS-like inspection of other miscellaneous structures.                                                                                                                                                 |
| O           | Overhead Non-Highway    | Yes                               | Yes                                 | NBIS-like inspection of structural components of overhead non-highway bridges.                                                                                                                          |
| P           | Problem Area (Special)  | No                                | No                                  | Not a Complete NBIS inspection. One time inspection limited to critical area(s). An inspection crane may be used.                                                                                       |
| R           | Regular (Routine)       | Yes                               | Yes                                 | NBIS. For 8' – 20' bridges also. Includes probing of substructure units (by wading only) for bridges over water.                                                                                        |
| S           | Sign Structure          | Yes                               | Yes                                 | NBIS-like inspection for sign structures. An inspection crane may be used.                                                                                                                              |
| T           | Retaining Wall          | Yes                               | Yes                                 | NBIS-like inspection for retaining walls and noise walls.                                                                                                                                               |
| U           | Underwater Only         | No                                | No                                  | Stand alone underwater inspection of substructure units by diving. (Primary Inspection date is date of the underwater inspection).                                                                      |
| W           | Routine with Underwater | Yes                               | Yes                                 | NBIS. For 8' – 20' bridges also. Underwater inspection of substructure units is performed by diving. (Primary Inspection date and underwater inspection date occur on same day).                        |
| X           | Unknown                 | N/A                               | N/A                                 |                                                                                                                                                                                                         |
| Z           | Inventory Only          | No                                | No                                  |                                                                                                                                                                                                         |

## 6B21 Crane Insp Dt - Crane Inspection Date

### 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

00/00/0000 Not applicable

## 6B22 (Not Used)

## 6B23 Member - Team Helper

### Description:

This narrative item is used to record the names(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

(Old BMS item E13)

### 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

### Description:

This item is used to record the local inspection agreement contract number.

### Procedure:

Enter the local inspection agreement contract number.

### Coding:

Local inspection agreement contract number.

## 6B26 NBI Crew - NBI Crew Hours (Actual)

(Old BMS item E09)

### 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)

(Old BMS item E10)

### 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)

### 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****Description:**

Not currently used

**6B30 UWater - Underwater Hours (Actual)****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****Description:**

Not currently used.

**6B32 Engineer - Inspection Engineering Cost**

(Old BMS item E11)

**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**

(Old BMS item E11)

**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**

(Old BMS item E11)

**Description:**

This item is used to record the 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****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**

(Old BMS item E19)

**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 CodesCoding    Indication

|      |                                                  |
|------|--------------------------------------------------|
| 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**

(Old BMS item E19)

**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, by 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.doc>

## 6B38 Appr Slab - Approach Slab

(Old BMS item E14)

### 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

(Old BMS item E15)

### 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

(Old BMS item E16)

### 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**

(Old BMS item M06)

**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**

(Old BMS item M01)

**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 formulas 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**

(Old BMS item M02)

### **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.

### **Coding:**

A specific number, to the nearest tenth, computed by the system.

Range: 0.0 - 30.0

## **6B44 S3 – Essentiality for Public Use Component**

(Old BMS item M03)

### **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 based on the data items: Defense Highway Indicator, Detour Length, and Average Daily Traffic. Refer to FHWA's SI&A Recording and Coding Guide for the formulas that define this item.

### **Coding:**

A specific number, to the nearest tenth, computed by the system.

Range: 0.0 - 15.0

## **6B45 S4 – Special Reductions Component**

(Old BMS item M04)

### **Description:**

This item is used to indicate the special reductions component of the Sufficiency Rating.

### **Procedure:**

Computed and entered automatically by the system based on the data items: Detour length, Traffic Safety Features and Structure Type, Main. Refer to FHWA's SI&A Recording and Coding Guide for the formulas that define this item.

### **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**

(Old BMS item M34)

### **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             |

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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.

To access and update the Agency Roadway information for a particular structure:

1. Select the structure from the structure list on the Pontis desktop, and double click on it.
2. The Inspection Tab card for the most recent inspection for the selected structure will appear by default.
3. Access the Agency Roadway screen by clicking on the 6 Agency tab and then selecting the 3 Roadways vertical tab.
4. Navigate through the available roadways by clicking on the Next/ Prior Button.
5. Check that the system is in Edit Mode in order to modify the data.
6. After modifying the data, click on to the Save button on the top of the screen to update the data to the database.

The screenshot shows the Pontis software interface for bridge inspections. The title bar reads "Bridge Inspection Mode: Edit Type: D - In-depth Key: VWLP". The menu bar includes "File", "Edit", "View", "Structure", "Bridge", "Notes", "Work", "Appraisal", "Inventory", "Inspections (2)", "Metric", "English", "Reports...", and "Save". The toolbar has buttons for "First Row", "Prior Row", "Next Row", and "Last Row". The main window is divided into several sections:

- Roadway Identification:** Fields include 5C03 On/Under (1 - Route On Structure), 5C04 Kind Hwy (N - Not applicable), 5C01 Rd/Rte Name (SIGN STRUCT), 5C06 Rte #/Suffix (00NNNN N), 5A07 Feature Inter (US 22 EB), 5C07 Facility Carried (SIGN STRUCTURE), 6C01 County, 6C02 St Rte Num, 6C03 Seg, 6C04 Offset.
- Roadway Admin:** Fields include 6C05 Adm Juris (N - Non-highway), 6C07 Govt Cont (blank), 6C06 Fed Aid, 6C08 Urban/Rural, 6C09 Hwy Ind, 6C10 Hwy Sys Typ (NN - Non-Highway), 6C11 State Code, 6C12 INT, 6C13 CCVNET, 6C14 ATTT, 6C15 RMS NHS, 6C16 TTTN, 6C22 Func Class.
- Network:** Fields include 6C25 Type (Unknown (NBI)), 6C26 Width (-1 ft), 6C27 ADTT, 6C28 ADTT Year, 5C10 Recent ADT, 5C11 ADT Year(30), 5C14 Truck %ADT, 6C29 Ovr Size Bypass Len.
- Clearance:** Fields include 4A20 Min Lat Under (L) (-1.0 ft), 4A19 Min Lat Under (R) (-1.0 ft), 6C18 Horiz (L) (.0 ft), 6C19 Horiz (R) (.0 ft), 6C20 Min Vert (L) (-1.0 ft), 6C21 Min Vert (R) (99.9 ft), 6C22 Def Vert (L) (-1.0 ft), 6C23 Def Vert (R) (99.9 ft), 6C24 Vert Clear Sign.
- Median:** Fields include 6C25 Type (Unknown (NBI)), 6C26 Width (-1 ft).
- Traffic:** Fields include 6C27 ADTT, 6C28 ADTT Year, 5C10 Recent ADT, 5C11 ADT Year(30), 5C14 Truck %ADT, 6C29 Ovr Size Bypass Len.
- Roadway Labels:** Fields include 6C30 Gen Seg Ahead Lbl, 6C31 User Seg Ahead Lbl, 6C32 Gen Seg Back Lbl, 6C33 User Seg Back Lbl.
- Feature Type:** Field includes 6C34 Feature Type (1 - Road).

Vertical tabs on the left side of the form are labeled: 1 Bridge, 2 Inspections, 3 Roadways (which is currently selected), and 4 Structure Units.

## **6C01 - 6C04 County, St Rte Num, Seg, Offset - State Roadway Location**

(Old BMS Items R01, PB08, B02)

### **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.

| <b>6C01</b> | <b>6C02</b> | <b>6C03</b> | <b>6C04</b> |
|-------------|-------------|-------------|-------------|
| 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.

| <b>6C01</b> | <b>6C02</b> | <b>6C03</b> | <b>6C04</b> |
|-------------|-------------|-------------|-------------|
| 22          | 0322        | 0010        | 0500        |
| 22          | 0322        | 0011        | 0600        |
| 22          | 2002        | 0060        | 1200        |

## **\*6C05 Adm Juris - Administrative Jurisdiction**

(Old BMS Item B16)

### **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**

(Old BMS Item R09)

**Description:**

This item is used to identify the roadway on/under the structure and its Federal Aid status. This item will be filled in automatically based on information from RMS.

**Procedure:**

For valid state routes entered in the SR ID and the on/under fields, the "Federal Aid" data is displayed based on information obtained from RMS.

**Coding:**

- 0 Not on Federal Aid Route
- 1 On Federal Aid Route
- 2 Other Federal Aid Route

**6C07 Govt Cont - Government Level of Control**

(Old BMS Item R08)

**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:**

The data displayed is based on RMS data.

**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**

(Old BMS Item R11)

**Description:**

This item indicates the Urban/Rural designation of a highway on or under the bridge.

**Procedure:**

For valid state routes entered in the SR ID and the on/under fields, the "Urban/Rural" designation code is displayed based on information obtained from the Roadway Management System.

**Coding:**

The designation code assigned to the SR ID.

- |   |                                         |
|---|-----------------------------------------|
| 1 | Rural                                   |
| 2 | Small Urban (population 5,000 - 49,999) |
| 3 | Urbanized (population > 49,999)         |

**6C09 Hwy Ind - Highway Indicator**

(Old BMS Item R12)

**Description:**

This item indicates whether or not the roadway on or under the bridge belongs to a state highway network.

**Procedure:**

If the roadway on or under the bridge belongs to a state highway network, check the indicator box. Otherwise, the box should remain unchecked.

**Coding:**

- |           |                                                                               |
|-----------|-------------------------------------------------------------------------------|
| Unchecked | The roadway on or under the bridge does not belong to a state highway network |
| Checked   | The roadway on or under the bridge belongs to a state highway network         |

## 6C10 Hwy Sys Typ - Highway System

(Old BMS Item B17)

### 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

(Old BMS Item B19)

### 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

(Old BMS Item R12)

**Description:**

This item indicates if the roadway belongs to the Interstate Network.

**Procedure:**

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 CCVNET - CCVNET Indicator

(Old BMS Item R12)

**Description:**

This item indicates if the roadway on or under the bridge is in the Containerized Cargo Vehicle Network (CCVNET).

**Procedure:**

For valid state routes entered in the 5C and 6C screens for SR ID and the on/under fields, the "CCVNET" designation is displayed based on information obtained from RMS.

**Coding:**

- Yes    Applicable Network
- No    Non-Applicable Network

## 6C14 ATTT - ATTT Indicator

(Old BMS Item R12)

**Description:**

This item indicates if the roadway on or under the bridge belongs to the Access Tandem Trailer Truck (ATTT) commercial network.

**Procedure:**

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

(Old BMS Item R12)

### Description:

This item indicates if the roadway on or under the bridge is on the National Highway System (NHS).

### Procedure:

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       | Y | NHS        |
| P | NHS, Congressional Priority Corridor | N | Not on NHS |
| C | NHS, Connector                       |   |            |

## 6C16 TTTN - TTTN Indicator

(Old BMS Item R12)

### Description:

This item indicates if the roadway on or under the bridge is in the Tandem Trailer Truck Network (TTTN) commercial network.

### Procedure:

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

## \*6C18 Horiz (L) - Total Horizontal Clearance for the Left Roadway

(Old BMS Item B21)

### 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, 2<sup>nd</sup> 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, 2<sup>nd</sup> 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.

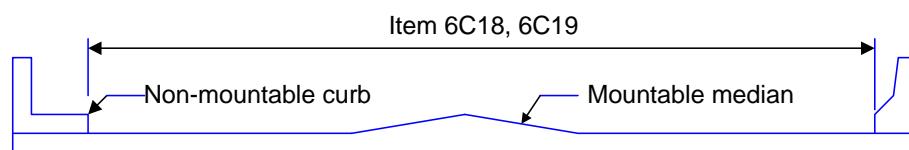
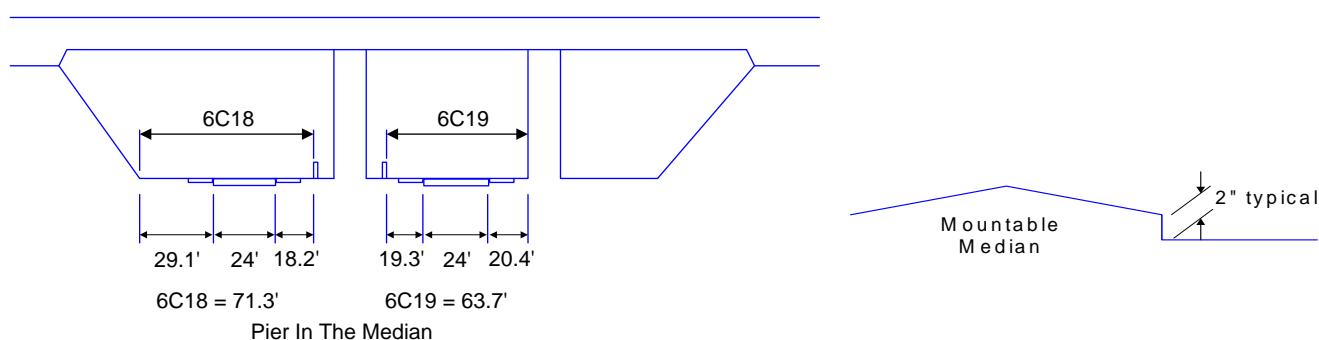
**Coding:**

The total horizontal clearance to the nearest tenth of a foot.

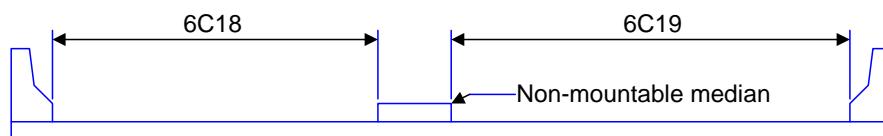
- |       |                                                                                                                                  |
|-------|----------------------------------------------------------------------------------------------------------------------------------|
| 998   | For clearances 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

(Old BMS Item B21)

### 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, 2<sup>nd</sup> 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, 2<sup>nd</sup> 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.<br>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

(Old BMS Item B22)

### Description:

This item is used to record the actual minimum vertical clearance for the left roadway over the features (streets, highways, railroads) 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 (MEDIAN TYPE coded 1-5, 7 or 9), enter the vertical clearance for the left roadway.

**Undivided Highway:**

In the case of a highway not separated by a median area or a median barrier (MEDIAN TYPE coded 6, 0 or N), enter the vertical clearance if the direction code in data item 5C06, 2<sup>nd</sup> subfield is 3 or 4. Otherwise, leave this item blank.

**Railroads (1):**

This item is not coded for railroads. See item 6C21. In the old BMS the vertical clearance for railroads was to be entered in the "Right Roadway" sub-field and the "Left Roadway" sub-field was to be left blank. **This procedure shall continue until further direction is provided.**

**Coding:**

- 9999 When no restriction exists
- 9912 When a restriction is 100 feet or greater (Applicable for Old BMS only. BMS2 allows users to enter clearances greater than 100 feet.)

Enter the vertical clearance for sign structures in this data field.

**Note:**

Measurements should be from the edge of through lane for the under feature and from the curb line for 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               | 99.99       |
| 14.25 feet         | 14.25       |
| 100 feet           | 100.00      |

## \*6C21 Min Vert (R) - Minimum Vertical Clearance for the Right Roadway

(Old BMS Item B22)

**Description:**

This item is used to record the actual minimum vertical clearance for the right roadway over the 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 (MEDIAN TYPE coded 1-5, 7 or 9), enter the vertical clearance for the right roadway.

**Undivided Highway:**

In the case of a highway not separated by a median area or a median barrier (MEDIAN TYPE coded 6, 0 or N), enter the vertical clearance if the direction code in data item 5C06, 2<sup>nd</sup> subfield is a 0, 1, or 2. Otherwise, leave this item blank.

**Railroads (1):**

If the feature beneath the structure is a railroad, 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 (Applicable for Old BMS only. BMS2 allows users to enter clearances greater than 100 feet.)

Enter the vertical clearance for sign structures in this data item.

**Note:**

Measurements should be from the edge of through lane for the under feature and from the curb line for 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.

## **\*6C22 Def Vert (L) - Vertical Clearance Over 10 Ft Width (Defense Highways) for Left Roadway**

(Old BMS Item B23)

**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 (MEDIAN TYPE coded 1-5, 7 or 9), enter the vertical clearance for the left roadway.

Refer to the Definitions Section of this Manual for sketches and definitions of left and right roadway.

**Undivided Highways:**

In the case of a highway not separated by a median area or median barrier (MEDIAN TYPE coded 6, 0 or N), enter the vertical clearance if the direction code in Data Item 5C06, 2<sup>nd</sup> subfield is 0, 1 or 2. Otherwise, leave this item blank.

When no restriction exists above the roadway, the clearance is unlimited and should be entered as 9999.

**Coding:**

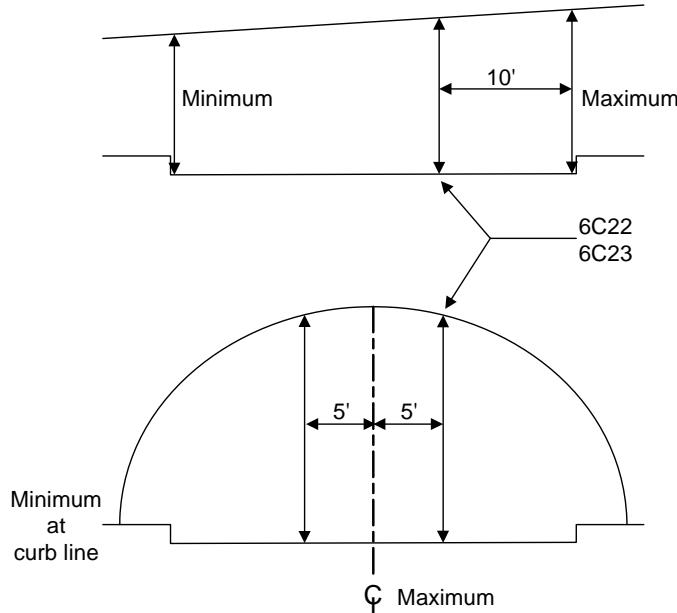
Vertical clearance to the nearest hundredth of a foot.

- 9912 Vertical clearance of 100 feet or greater. (Applicable for Old BMS only. BMS2 allows users to enter clearances greater than 100 feet.)

9999      Unlimited vertical clearance  
 Blank      Not applicable

**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

(Old BMS Item B23)

### 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 (MEDIAN TYPE coded 1-5, 7 or 9), enter the vertical clearance for the right roadway.

Refer to the Definitions Section of this Manual for sketches and definitions of left and right roadway.

#### Undivided Highways:

In the case of a highway not separated by a median area or median barrier (MEDIAN TYPE coded 6, 0 or N), enter the vertical clearance if the direction code in Data Item 5C06, 2<sup>nd</sup> subfield is a 0, 1, or 2. Otherwise, leave this field blank.

When no restriction exists above the roadway, the clearance is unlimited and should be entered as 9999.

### Coding:

Vertical clearance to the nearest hundredth of a foot.

9912      Vertical clearance of 100 feet or greater (Applicable for Old BMS only. BMS2 allows users to enter clearances greater than 100 feet.)

- 9999      Unlimited vertical clearance  
Blank      Not applicable

**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 Vert Clear Sign - Vertical Clearance Signing**

(Old BMS Item B31)

**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.

**Procedure:**

Select the appropriate code from the dropdown list. Vertical clearance posting signs are required when the vertical clearance is 14'-6" or less.

**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 actual measurements (due to new roadway surface wearing course) and need to be replaced

## **\*6C25 Type - Median Type**

(Old BMS Item B10)

**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:**

- N      Not applicable (1 lane traffic or non-highway related feature)
- 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

## \*6C26 Width - Median Width

(Old BMS Item B10)

### Description:

This item is used to record the width of the median, where applicable.

### Procedure:

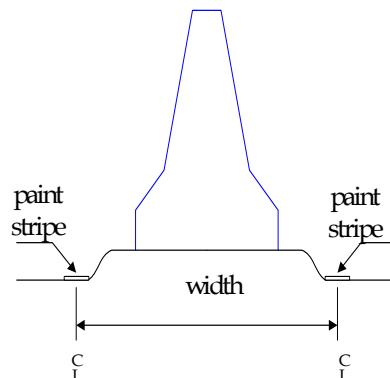
Enter the width of the median to the nearest foot. The median width is the distance between inside edges of through lanes.

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 pain 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

(Old BMS Items B29 and R06)

### Description:

This item is used to record the "current" average annual daily truck traffic volume.

### 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.

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

(Old BMS Items B30 and R07)

### 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 Ovr Size Bypass Len - Oversize Bypass Length****Description:**

This item is used to record the length of a detour for oversize vehicles that cannot cross or pass under the structure.

**Procedure:**

Enter the length of the detour for oversize vehicles that cannot cross or pass under the structure.

**Coding:**

Detour length to the nearest mile.

**6C30 Gen Seg Ahead Lbl - General Segment Ahead Label**

(Old BMS PR screen)

**Description:**

This item is used to record a description of the roadway segment ahead.

**Procedure:**

This item is automatically filled in from RMS.

**6C31 User Seg Ahead Lbl - User Segment Ahead Label**

(Old BMS PR screen)

**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**

(Old BMS PR screen)

**Description:**

This item is used to record a description of the roadway segment behind.

**Procedure:**

This item is automatically filled in from RMS.

## 6C33 User Seg Back Lbl - User Segment Back Label (Old BMS PR screen)

### **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

### **Description:**

This item is used to record the description of the type of each feature.

### **Procedure:**

Select the feature type for each "on" and "under" feature from the dropdown list.

### **Coding:**

- 1-Road
- 2-Railroad
- 3-Waterway

## 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.

**Bridge Inspection Mode: Edit Type: R - Regular (routine) Key: 0010**

| Bridge:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Find...                  | Inspections (10):   | <input type="radio"/> Metric | <input checked="" type="radio"/> English | Reports...      | Save                     |                       |                   |                    |                             |                     |                     |  |                  |                     |  |                            |                          |          |                          |  |  |  |                    |                          |             |                          |  |  |  |                |                          |  |  |  |                     |              |           |              |      |                          |  |  |  |                    |                          |  |  |  |             |                          |  |  |  |                |                          |  |  |  |          |  |  |  |  |
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| <b>1 CONDITION</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <b>2 NOTES</b>           | <b>3 WORK</b>       | <b>4 APPRAISAL</b>           | <b>5 INVENTORY</b>                       | <b>6 AGENCY</b> | <b>7 SCHEDULE</b>        |                       |                   |                    |                             |                     |                     |  |                  |                     |  |                            |                          |          |                          |  |  |  |                    |                          |             |                          |  |  |  |                |                          |  |  |  |                     |              |           |              |      |                          |  |  |  |                    |                          |  |  |  |             |                          |  |  |  |                |                          |  |  |  |          |  |  |  |  |
| <b>Summary:</b> <table> <tr> <td>7A01 Inspection Date:</td> <td>7A02 Team Leader:</td> <td>7A03 Primary Type:</td> <td colspan="4">7A06 Inspections Performed:</td> </tr> <tr> <td></td> <td></td> <td></td> <td>National Bridge Inventory:</td> <td><input type="checkbox"/></td> <td>Element:</td> <td><input type="checkbox"/></td> </tr> <tr> <td></td> <td></td> <td></td> <td>Fracture Critical:</td> <td><input type="checkbox"/></td> <td>Underwater:</td> <td><input type="checkbox"/></td> </tr> <tr> <td></td> <td></td> <td></td> <td>Other Special:</td> <td><input type="checkbox"/></td> <td></td> <td></td> </tr> </table><br><b>Schedule:</b> <table> <tr> <th></th> <th>7A07 Required (Y/N)</th> <th>7A08 Last Dt</th> <th>7A09 Freq</th> <th>7A10 Next Dt</th> </tr> <tr> <td>NBI:</td> <td><input type="checkbox"/></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Fracture Critical:</td> <td><input type="checkbox"/></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Underwater:</td> <td><input type="checkbox"/></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Other Special:</td> <td><input type="checkbox"/></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Element:</td> <td></td> <td></td> <td></td> <td></td> </tr> </table> |                          |                     |                              |                                          |                 |                          | 7A01 Inspection Date: | 7A02 Team Leader: | 7A03 Primary Type: | 7A06 Inspections Performed: |                     |                     |  |                  |                     |  | National Bridge Inventory: | <input type="checkbox"/> | Element: | <input type="checkbox"/> |  |  |  | Fracture Critical: | <input type="checkbox"/> | Underwater: | <input type="checkbox"/> |  |  |  | Other Special: | <input type="checkbox"/> |  |  |  | 7A07 Required (Y/N) | 7A08 Last Dt | 7A09 Freq | 7A10 Next Dt | NBI: | <input type="checkbox"/> |  |  |  | Fracture Critical: | <input type="checkbox"/> |  |  |  | Underwater: | <input type="checkbox"/> |  |  |  | Other Special: | <input type="checkbox"/> |  |  |  | Element: |  |  |  |  |
| 7A01 Inspection Date:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 7A02 Team Leader:        | 7A03 Primary Type:  | 7A06 Inspections Performed:  |                                          |                 |                          |                       |                   |                    |                             |                     |                     |  |                  |                     |  |                            |                          |          |                          |  |  |  |                    |                          |             |                          |  |  |  |                |                          |  |  |  |                     |              |           |              |      |                          |  |  |  |                    |                          |  |  |  |             |                          |  |  |  |                |                          |  |  |  |          |  |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                          |                     | National Bridge Inventory:   | <input type="checkbox"/>                 | Element:        | <input type="checkbox"/> |                       |                   |                    |                             |                     |                     |  |                  |                     |  |                            |                          |          |                          |  |  |  |                    |                          |             |                          |  |  |  |                |                          |  |  |  |                     |              |           |              |      |                          |  |  |  |                    |                          |  |  |  |             |                          |  |  |  |                |                          |  |  |  |          |  |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                          |                     | Fracture Critical:           | <input type="checkbox"/>                 | Underwater:     | <input type="checkbox"/> |                       |                   |                    |                             |                     |                     |  |                  |                     |  |                            |                          |          |                          |  |  |  |                    |                          |             |                          |  |  |  |                |                          |  |  |  |                     |              |           |              |      |                          |  |  |  |                    |                          |  |  |  |             |                          |  |  |  |                |                          |  |  |  |          |  |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                          |                     | Other Special:               | <input type="checkbox"/>                 |                 |                          |                       |                   |                    |                             |                     |                     |  |                  |                     |  |                            |                          |          |                          |  |  |  |                    |                          |             |                          |  |  |  |                |                          |  |  |  |                     |              |           |              |      |                          |  |  |  |                    |                          |  |  |  |             |                          |  |  |  |                |                          |  |  |  |          |  |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 7A07 Required (Y/N)      | 7A08 Last Dt        | 7A09 Freq                    | 7A10 Next Dt                             |                 |                          |                       |                   |                    |                             |                     |                     |  |                  |                     |  |                            |                          |          |                          |  |  |  |                    |                          |             |                          |  |  |  |                |                          |  |  |  |                     |              |           |              |      |                          |  |  |  |                    |                          |  |  |  |             |                          |  |  |  |                |                          |  |  |  |          |  |  |  |  |
| NBI:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <input type="checkbox"/> |                     |                              |                                          |                 |                          |                       |                   |                    |                             |                     |                     |  |                  |                     |  |                            |                          |          |                          |  |  |  |                    |                          |             |                          |  |  |  |                |                          |  |  |  |                     |              |           |              |      |                          |  |  |  |                    |                          |  |  |  |             |                          |  |  |  |                |                          |  |  |  |          |  |  |  |  |
| Fracture Critical:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <input type="checkbox"/> |                     |                              |                                          |                 |                          |                       |                   |                    |                             |                     |                     |  |                  |                     |  |                            |                          |          |                          |  |  |  |                    |                          |             |                          |  |  |  |                |                          |  |  |  |                     |              |           |              |      |                          |  |  |  |                    |                          |  |  |  |             |                          |  |  |  |                |                          |  |  |  |          |  |  |  |  |
| Underwater:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <input type="checkbox"/> |                     |                              |                                          |                 |                          |                       |                   |                    |                             |                     |                     |  |                  |                     |  |                            |                          |          |                          |  |  |  |                    |                          |             |                          |  |  |  |                |                          |  |  |  |                     |              |           |              |      |                          |  |  |  |                    |                          |  |  |  |             |                          |  |  |  |                |                          |  |  |  |          |  |  |  |  |
| Other Special:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <input type="checkbox"/> |                     |                              |                                          |                 |                          |                       |                   |                    |                             |                     |                     |  |                  |                     |  |                            |                          |          |                          |  |  |  |                    |                          |             |                          |  |  |  |                |                          |  |  |  |                     |              |           |              |      |                          |  |  |  |                    |                          |  |  |  |             |                          |  |  |  |                |                          |  |  |  |          |  |  |  |  |
| Element:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                          |                     |                              |                                          |                 |                          |                       |                   |                    |                             |                     |                     |  |                  |                     |  |                            |                          |          |                          |  |  |  |                    |                          |             |                          |  |  |  |                |                          |  |  |  |                     |              |           |              |      |                          |  |  |  |                    |                          |  |  |  |             |                          |  |  |  |                |                          |  |  |  |          |  |  |  |  |
| <b>Bridge Inspection Resources:</b> <table> <tr> <td>7A11 Next Team Lead:</td> <td>7A12 NBI Crew Hr:</td> <td>7A13 Crane Hours:</td> </tr> <tr> <td>7A14 Next Insp By:</td> <td>7A15 Frac Crit Hrs:</td> <td>7A16 Other 1 Hours:</td> </tr> <tr> <td></td> <td>7A17 UWater Hrs:</td> <td>7A18 Other 2 Hours:</td> </tr> </table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                          |                     |                              |                                          |                 |                          | 7A11 Next Team Lead:  | 7A12 NBI Crew Hr: | 7A13 Crane Hours:  | 7A14 Next Insp By:          | 7A15 Frac Crit Hrs: | 7A16 Other 1 Hours: |  | 7A17 UWater Hrs: | 7A18 Other 2 Hours: |  |                            |                          |          |                          |  |  |  |                    |                          |             |                          |  |  |  |                |                          |  |  |  |                     |              |           |              |      |                          |  |  |  |                    |                          |  |  |  |             |                          |  |  |  |                |                          |  |  |  |          |  |  |  |  |
| 7A11 Next Team Lead:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 7A12 NBI Crew Hr:        | 7A13 Crane Hours:   |                              |                                          |                 |                          |                       |                   |                    |                             |                     |                     |  |                  |                     |  |                            |                          |          |                          |  |  |  |                    |                          |             |                          |  |  |  |                |                          |  |  |  |                     |              |           |              |      |                          |  |  |  |                    |                          |  |  |  |             |                          |  |  |  |                |                          |  |  |  |          |  |  |  |  |
| 7A14 Next Insp By:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 7A15 Frac Crit Hrs:      | 7A16 Other 1 Hours: |                              |                                          |                 |                          |                       |                   |                    |                             |                     |                     |  |                  |                     |  |                            |                          |          |                          |  |  |  |                    |                          |             |                          |  |  |  |                |                          |  |  |  |                     |              |           |              |      |                          |  |  |  |                    |                          |  |  |  |             |                          |  |  |  |                |                          |  |  |  |          |  |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 7A17 UWater Hrs:         | 7A18 Other 2 Hours: |                              |                                          |                 |                          |                       |                   |                    |                             |                     |                     |  |                  |                     |  |                            |                          |          |                          |  |  |  |                    |                          |             |                          |  |  |  |                |                          |  |  |  |                     |              |           |              |      |                          |  |  |  |                    |                          |  |  |  |             |                          |  |  |  |                |                          |  |  |  |          |  |  |  |  |

**\*7A01 Inspection Date**

(Old BMS Items E06, J01, S01, T01, W01 and W01-A)

**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 iForms.

**Coding:**

The inspection date (month-day-year). Prefix with zeros where necessary.

**Example:**

Assume an inspection date of March 7, 1979: 03/07/1979

**Note:**

Code sign structures and retaining walls the same.

**7A02 Team Leader****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**

(Old BMS Items E07, S01-A, W02, W02-A)

**Description:**

This item is used to record the primary type of inspection that was performed on the bridge.

**Procedure:**

Select the code that describes the type of inspection that was performed on the bridge. Required interval and potential for reduced interval applicability for the inspection types are shown for each type of inspection. Note that if a complete and thorough underwater and/or fatigue and fracture critical inspection is performed, the Inspection - Underwater (OSA and Sub-units tabs) and/or the Fracture Critical (IF) screens must also be added or updated.

**Coding:**

| 7A03 | Type                    | 24 month<br>NBI Insp.<br>Interval | < 24 month<br>NBI Insp.<br>Interval | Comments                                                                                                                                                                                                |
|------|-------------------------|-----------------------------------|-------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A    | Access Equipment Only   | No                                | No                                  | Follow-up with access equipment (e.g. crane, lift, rigging) to complete inspection of remote bridge elements                                                                                            |
| B    | Damage                  | No                                | No                                  | Not a full NBIS Inspection – limited to damaged elements. An inspection crane may be used.                                                                                                              |
| C    | Routine Using Crane     | Yes                               | Yes                                 | NBIS. A complete routine NBIS inspection where the inspection crane is utilized.                                                                                                                        |
| D    | In-Depth                | No                                | No                                  | If In-Depth inspection scope meets/exceeds requirements for Routine inspection, code "R". For in-depth inspections scoped for critical areas only, code "D". An inspection crane may be used.           |
| E    | Element Inventory Only  | No                                | No                                  | Inventory of element level data only.                                                                                                                                                                   |
| F    | Initial (First Time)    | Yes                               | N/A                                 | NBIS. For 8' – 20' bridges also.                                                                                                                                                                        |
| G    | Fracture Critical       | No                                | No                                  | <b>Do Not Use</b> Historical information only for code identification from superseded BMS AJ screen.                                                                                                    |
| H    | Highway Environs Only   | Yes                               | N/A                                 | Inspection of non-highway bridges/structures over highways. Inspection limited to highway environs.                                                                                                     |
| I    | Interim (Special)       | No                                | Yes                                 | For 8' – 20' bridges also. Not a complete NBIS inspection. A special inspection limited to critical areas to meet reduced inspection interval. Otherwise use 7A03 = P. An inspection crane may be used. |
| M    | Miscellaneous           | Yes                               | Yes                                 | NBIS-like inspection of other miscellaneous structures.                                                                                                                                                 |
| O    | Overhead Non-Highway    | Yes                               | Yes                                 | NBIS-like inspection of structural components of overhead non-highway bridges.                                                                                                                          |
| P    | Problem Area (Special)  | No                                | No                                  | Not a Complete NBIS inspection. One time inspection limited to critical area(s). An inspection crane may be used.                                                                                       |
| R    | Regular (Routine)       | Yes                               | Yes                                 | NBIS. For 8' – 20' bridges also. Includes probing of substructure units (by wading only) for bridges over water.                                                                                        |
| S    | Sign Structure          | Yes                               | Yes                                 | NBIS-like inspection for sign structures. An inspection crane may be used.                                                                                                                              |
| T    | Retaining Wall          | Yes                               | Yes                                 | NBIS-like inspection for retaining walls and noise walls.                                                                                                                                               |
| U    | Underwater Only         | No                                | No                                  | Stand alone underwater inspection of substructure units by diving. (Primary Inspection date is date of the underwater inspection).                                                                      |
| W    | Routine with Underwater | Yes                               | Yes                                 | NBIS. For 8' – 20' bridges also. Underwater inspection of substructure units is performed by diving. (Primary Inspection date and underwater inspection date occur on same day).                        |
| X    | Unknown                 | N/A                               | N/A                                 |                                                                                                                                                                                                         |
| Z    | Inventory Only          | No                                | No                                  |                                                                                                                                                                                                         |

**Example:**

- U Includes stand alone underwater inspection by divers only.
- W Includes inspection of submerged elements of substructure units, including foundation, by divers as a concurrent part of the regular NBIS inspection.

See Item 7A06 for additional examples

Old BMS codes:

- |                                                  |                                            |
|--------------------------------------------------|--------------------------------------------|
| 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

**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

(Old BMS Items E08, E12, S03, T03)

**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, team member names or 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)                                            |

## 7A06 Inspections Performed - Type of Inspections Performed

### Description:

This series of five checkbox fields is used to indicate which types of inspections have been performed during the current inspection: National Bridge Inventory (NBI), Element, Fracture Critical, Underwater, and Other Special.

### Procedure:

The appropriate box(es) must be checked to indicate each type of inspection information collected. Multiple boxes can be checked. For example, NBI and Fracture Critical and Element inspections would be checked if performed during the same inspection. Caution should be exercised about modifying the type of an existing inspection record. In particular, if Element was previously checked and then is unchecked, all element condition data for that inspection will be deleted and Screen 1A will show that it is not an element inspection. If re-checked, the system will make it an element inspection by selecting a previous element inspection based on the search criteria described elsewhere in the system. Underwater inspection type should only be checked when divers are used. It must not be checked for a routine inspection of the submerged portions of the substructure when probing/wading is used as the method of access.

### Coding:

For each inspection type (NBI, Element Level, Fracture Critical, Underwater, Other Special):

- |           |                                           |
|-----------|-------------------------------------------|
| Unchecked | Inspection of this type was not performed |
| Checked   | Inspection of this type was performed     |

### Examples:

1. A NBI (routine inspection) on a through truss is to be performed. The through truss is a fracture critical structure and inspected in accordance with Publication 238, Section IP 2.4 requirements for fatigue and fracture inspections. Inspectors performed probing using waders. An element level inspection was not performed.

7A03 Type of inspection: R - Routine

7A06 Checkboxes to be checked: NBI and Fracture Critical.

2. A NBI (routine inspection) on a Girder - Floorbeam -stringer bridge is to be performed. The bridge is fracture critical and inspected in accordance with Publication 238, Section IP 2.4 requirements for fatigue and fracture inspections. Inspectors performed probing using waders. An element level inspection was performed.

7A03 Type of inspection: R - Routine

7A06 Checkboxes to be checked: NBI, Element and Fracture Critical.

3. NBI (routine inspection) and element inspections are to be performed on a pre-stressed spread box beam bridge. Inspectors performed probing using waders.

7A03 Type of inspection: R - Routine

7A06 Checkboxes to be checked: NBI and Element.

4. An In-Depth inspection of a bridge that met the requirements for Routine inspection was performed.

7A03 Type of inspection: R - Routine

7A06 Checkboxes to be checked: NBI, Other Special

5. An in-depth inspection of a bridge that covered only the concrete beams of a bridge was performed.

7A03 Type of inspection: D- In-Depth

7A06 Checkboxes to be checked: Other Special

6. An Interim inspection is to be performed on a critical area of superstructure only. Inspection does not fulfill NBI requirements.

7A03 Type of inspection: I - Interim

7A06 Checkboxes to be checked: Other Special

7. An underwater inspection was performed by divers.

7A03 Type of inspection: U - Underwater

7A06 Checkboxes to be checked: Underwater.

8. A routine inspection for a sign structure was performed.

7A03 Type of inspection: S - Sign Structure

7A06 Checkboxes to be checked: NBI

## 7A07 Required (Y/N) - Required Inspections

### 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.

### Procedure:

The appropriate boxes should be checked or unchecked to indicate whether or not Fracture Critical, Underwater, and/or Other Special inspections are required for the structure. Except for Other Special, these need only be entered during an initial inspection based on the type of structure. Other Special should only be entered if there is a need to conduct a focused Special Inspection at an interval less than the NBI interval for the structure.

### 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

## 7A08 Last Dt - Last Inspection Date

### Description:

This series of four fields is used to record the date of the most recent inspection for the structure, by type of inspection.

### 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.

### Coding:

Date of last inspection in MM/DD/YYYY format:

MM        2 digit month

DD        2 digit day of month

YYYY      4 digit year

**\*7A09 Freq - Inspection Frequency**

(Old BMS Items E01, J05, S02, T02, W03, W04)

**Description:**

This series of five fields is used to record the number of months between inspections, by type of inspection.

**Procedure:**

Enter the number of months from the last until the next inspection is due for each inspection type: NBI, Element Level, Fracture Critical, Underwater, and Other Special.

**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.

Fracture Critical: An inspection frequency is required for all fracture critical bridges. In most cases, the inspection frequency is the same as the NBI frequency.

Underwater: Refer to Publication 238 Table 2.6.2.3-1 for required underwater inspection intervals.

Other Special: Enter the inspection interval for regularly scheduled interim inspections.

Element: For bridges that require an element level inspection, the frequency is identical to the NBI inspection frequency.

**\*7A10 Next Dt - Next Inspection Date**

(Old BMS Item E05)

**Description:**

This series of five fields is used to record the date of the next required inspection by type of inspection.

**Procedure:**

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 recalculation button to the right of the "Next Inspection Date" label.

**Coding:**

Next inspection date for each inspection type.

**7A11 Next Team Lead - Next Team Leader****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 Hr - NBI Inspection Crew Hours**

(Old BMS Items E09, S14, T09)

**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**

(Old BMS Item E10)

**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 (Old BMS Item E02)

### 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 Hrs - Fracture Critical Inspection Hours

### 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****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 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 Hrs - Underwater Inspection Hours****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****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 hours required for inspection of the structure, which are not accounted for in other fields.

**Coding:**

The number of hours, to the nearest hour.

## AP Agency Project

The Agency Project screen is used to enter additional information on new BMS2 projects created and to display project related information from the Multi-Modal Project Management System (MPMS) and SAP/Plant Maintenance.

Existing MPMS projects in old BMS were converted to BMS2 and linked to MPMS. However, as new projects are identified, planned and programmed, they must be created in BMS2 as described in section 2.6.6 of this manual. The MPMS project number must be entered in item AP01, and item AP06, Work Designated For, must be coded "M" in order for the two systems to integrate and share information.

To view and update Agency Project information for a particular project:

1. Select the Project Plan module on the inspection desktop.
2. When Project Plan desktop is displayed, select the "Bridges" radio button.
3. Click on the "Select" tab. When the Select screen opens, click on the "Clear Selection" button. Within the selection screen, at the bottom under "Bridges", uncheck the "all" box and type in the Bridge SRID (without hyphens). Then Click "OK".
4. Once the bridge is on the desktop, click on the "Sync Lists" button on the left had side of the screen. This function will find all projects associated with the bridge(s) and list them on the Project Plan desktop.
5. Open the desired project by clicking on the project line.
6. The Project screen with information related to the selected project will appear.
7. Access Agency Project screen by clicking on the Agency tab.
8. Check that the system is in Edit Mode in order to modify the data.
9. After modifying the data, click the Close button on the screen to update the data to the database.

The screen lists all the fields used to capture additional project information. Most of the fields are display only, since they are based on information from MPMS system or SAP/Plant Maintenance system and are retrieved via interfaces to those systems.

Project A-PADOT-6814-5 05H07 (row 1 of 1357 )

| Project ID<br>05102200100063                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Project Name   | Program<br>FY 07/08 Maintenance                                                                                                                                                                                                                                                                                                                                     | Year<br>2007 1 - | <input type="button" value="^"/> <input type="button" value="v"/>                                                                                                           |               |                |                   |                |               |             |        |        |        |        |                          |        |        |        |        |                    |        |        |        |        |                 |        |        |        |        |                    |        |        |        |        |                    |        |        |        |        |                   |        |        |        |        |                  |        |        |        |        |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|----------------|-------------------|----------------|---------------|-------------|--------|--------|--------|--------|--------------------------|--------|--------|--------|--------|--------------------|--------|--------|--------|--------|-----------------|--------|--------|--------|--------|--------------------|--------|--------|--------|--------|--------------------|--------|--------|--------|--------|-------------------|--------|--------|--------|--------|------------------|--------|--------|--------|--------|
| <input type="button" value="Overview"/> <input type="button" value="Work Items"/> <input type="button" value="Contract &amp; Funding"/> <input type="button" value="Agency"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                |                                                                                                                                                                                                                                                                                                                                                                     |                  |                                                                                                                                                                             |               |                |                   |                |               |             |        |        |        |        |                          |        |        |        |        |                    |        |        |        |        |                 |        |        |        |        |                    |        |        |        |        |                    |        |        |        |        |                   |        |        |        |        |                  |        |        |        |        |
| <b>Bridge Project</b><br>AP01 MPMS Project Number: <input type="text"/><br>AP02 Bridge Project Indicator: <input type="checkbox"/><br>AP40 Project Class: <input type="button" value="▼"/><br>AP41 Project Status: <input type="button" value="0 - Proposed"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                | <b>Bridge Bill Indicators</b><br>AP03 Design: <input type="checkbox"/><br>AP04 ROW/Utilities: <input type="checkbox"/><br>AP05 Construction: <input type="checkbox"/><br>AP42 Bridge Bill Number: <input type="text"/>                                                                                                                                              |                  | <b>AP08 Federal Aid Project Numbers</b><br><input type="text"/><br><input type="text"/>                                                                                     |               |                |                   |                |               |             |        |        |        |        |                          |        |        |        |        |                    |        |        |        |        |                 |        |        |        |        |                    |        |        |        |        |                    |        |        |        |        |                   |        |        |        |        |                  |        |        |        |        |
| <b>Contract Management</b><br>AP06 Work Designated For: <input type="button" value="▼"/><br>AP07 ECMS Number: <input type="text"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                | <b>Maintenance Project Information</b><br>AP09 SAP WO Num: <input type="text"/><br>AP10 SAP WO Status: <input type="text"/><br>AP11 WBS: <input type="text"/>                                                                                                                                                                                                       |                  | <b>Twelve Year Program Indicators</b><br>AP12 Construction: <input type="checkbox"/><br>AP13 Design: <input type="checkbox"/><br>AP14 ROW/Utility: <input type="checkbox"/> |               |                |                   |                |               |             |        |        |        |        |                          |        |        |        |        |                    |        |        |        |        |                 |        |        |        |        |                    |        |        |        |        |                    |        |        |        |        |                   |        |        |        |        |                  |        |        |        |        |
| <b>AP15 State Project Number</b><br>System: <input type="text"/> Route: <input type="text"/><br>Subproject: <input type="text"/> Phase: <input type="text"/><br>Section: <input type="text"/> Organization: <input type="text"/><br>Program: <input type="text"/> AP16 WBS: <input type="text"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                | <b>Project Activity Dates (Actual)</b><br>AP17 Contract Letting: <input type="text"/> 00/00/0000 AP18 Contract Award: <input type="text"/> 00/00/0000<br>AP19 NTP: <input type="text"/> 00/00/0000 AP20 Completion: <input type="text"/> 00/00/0000<br>AP21 Open to Traffic: <input type="text"/> 00/00/0000 AP22 Final Acceptance: <input type="text"/> 00/00/0000 |                  |                                                                                                                                                                             |               |                |                   |                |               |             |        |        |        |        |                          |        |        |        |        |                    |        |        |        |        |                 |        |        |        |        |                    |        |        |        |        |                    |        |        |        |        |                   |        |        |        |        |                  |        |        |        |        |
| <table border="1"> <thead> <tr> <th>Project Phase</th> <th>Rough Estimate</th> <th>Engineer Estimate</th> <th>Estimated Cost</th> <th>Approved Cost</th> </tr> </thead> <tbody> <tr> <td>AP23 Study:</td> <td>\$0.00</td> <td>\$0.00</td> <td>\$0.00</td> <td>\$0.00</td> </tr> <tr> <td>AP24 Preliminary Design:</td> <td>\$0.00</td> <td>\$0.00</td> <td>\$0.00</td> <td>\$0.00</td> </tr> <tr> <td>AP25 Right of Way:</td> <td>\$0.00</td> <td>\$0.00</td> <td>\$0.00</td> <td>\$0.00</td> </tr> <tr> <td>AP26 Utilities:</td> <td>\$0.00</td> <td>\$0.00</td> <td>\$0.00</td> <td>\$0.00</td> </tr> <tr> <td>AP27 Final Design:</td> <td>\$0.00</td> <td>\$0.00</td> <td>\$0.00</td> <td>\$0.00</td> </tr> <tr> <td>AP28 Construction:</td> <td>\$0.00</td> <td>\$0.00</td> <td>\$0.00</td> <td>\$0.00</td> </tr> <tr> <td>AP29 Other Costs:</td> <td>\$0.00</td> <td>\$0.00</td> <td>\$0.00</td> <td>\$0.00</td> </tr> <tr> <td>AP30 Total Cost:</td> <td>\$0.00</td> <td>\$0.00</td> <td>\$0.00</td> <td>\$0.00</td> </tr> </tbody> </table> |                |                                                                                                                                                                                                                                                                                                                                                                     |                  |                                                                                                                                                                             | Project Phase | Rough Estimate | Engineer Estimate | Estimated Cost | Approved Cost | AP23 Study: | \$0.00 | \$0.00 | \$0.00 | \$0.00 | AP24 Preliminary Design: | \$0.00 | \$0.00 | \$0.00 | \$0.00 | AP25 Right of Way: | \$0.00 | \$0.00 | \$0.00 | \$0.00 | AP26 Utilities: | \$0.00 | \$0.00 | \$0.00 | \$0.00 | AP27 Final Design: | \$0.00 | \$0.00 | \$0.00 | \$0.00 | AP28 Construction: | \$0.00 | \$0.00 | \$0.00 | \$0.00 | AP29 Other Costs: | \$0.00 | \$0.00 | \$0.00 | \$0.00 | AP30 Total Cost: | \$0.00 | \$0.00 | \$0.00 | \$0.00 |
| Project Phase                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Rough Estimate | Engineer Estimate                                                                                                                                                                                                                                                                                                                                                   | Estimated Cost   | Approved Cost                                                                                                                                                               |               |                |                   |                |               |             |        |        |        |        |                          |        |        |        |        |                    |        |        |        |        |                 |        |        |        |        |                    |        |        |        |        |                    |        |        |        |        |                   |        |        |        |        |                  |        |        |        |        |
| AP23 Study:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | \$0.00         | \$0.00                                                                                                                                                                                                                                                                                                                                                              | \$0.00           | \$0.00                                                                                                                                                                      |               |                |                   |                |               |             |        |        |        |        |                          |        |        |        |        |                    |        |        |        |        |                 |        |        |        |        |                    |        |        |        |        |                    |        |        |        |        |                   |        |        |        |        |                  |        |        |        |        |
| AP24 Preliminary Design:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | \$0.00         | \$0.00                                                                                                                                                                                                                                                                                                                                                              | \$0.00           | \$0.00                                                                                                                                                                      |               |                |                   |                |               |             |        |        |        |        |                          |        |        |        |        |                    |        |        |        |        |                 |        |        |        |        |                    |        |        |        |        |                    |        |        |        |        |                   |        |        |        |        |                  |        |        |        |        |
| AP25 Right of Way:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | \$0.00         | \$0.00                                                                                                                                                                                                                                                                                                                                                              | \$0.00           | \$0.00                                                                                                                                                                      |               |                |                   |                |               |             |        |        |        |        |                          |        |        |        |        |                    |        |        |        |        |                 |        |        |        |        |                    |        |        |        |        |                    |        |        |        |        |                   |        |        |        |        |                  |        |        |        |        |
| AP26 Utilities:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | \$0.00         | \$0.00                                                                                                                                                                                                                                                                                                                                                              | \$0.00           | \$0.00                                                                                                                                                                      |               |                |                   |                |               |             |        |        |        |        |                          |        |        |        |        |                    |        |        |        |        |                 |        |        |        |        |                    |        |        |        |        |                    |        |        |        |        |                   |        |        |        |        |                  |        |        |        |        |
| AP27 Final Design:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | \$0.00         | \$0.00                                                                                                                                                                                                                                                                                                                                                              | \$0.00           | \$0.00                                                                                                                                                                      |               |                |                   |                |               |             |        |        |        |        |                          |        |        |        |        |                    |        |        |        |        |                 |        |        |        |        |                    |        |        |        |        |                    |        |        |        |        |                   |        |        |        |        |                  |        |        |        |        |
| AP28 Construction:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | \$0.00         | \$0.00                                                                                                                                                                                                                                                                                                                                                              | \$0.00           | \$0.00                                                                                                                                                                      |               |                |                   |                |               |             |        |        |        |        |                          |        |        |        |        |                    |        |        |        |        |                 |        |        |        |        |                    |        |        |        |        |                    |        |        |        |        |                   |        |        |        |        |                  |        |        |        |        |
| AP29 Other Costs:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | \$0.00         | \$0.00                                                                                                                                                                                                                                                                                                                                                              | \$0.00           | \$0.00                                                                                                                                                                      |               |                |                   |                |               |             |        |        |        |        |                          |        |        |        |        |                    |        |        |        |        |                 |        |        |        |        |                    |        |        |        |        |                    |        |        |        |        |                   |        |        |        |        |                  |        |        |        |        |
| AP30 Total Cost:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | \$0.00         | \$0.00                                                                                                                                                                                                                                                                                                                                                              | \$0.00           | \$0.00                                                                                                                                                                      |               |                |                   |                |               |             |        |        |        |        |                          |        |        |        |        |                    |        |        |        |        |                 |        |        |        |        |                    |        |        |        |        |                    |        |        |        |        |                   |        |        |        |        |                  |        |        |        |        |
| AP31 Anticipated Environment Clearance Level: <input type="text"/> <input type="button" value="▼"/> AP32 ROW Needed?: <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                |                                                                                                                                                                                                                                                                                                                                                                     |                  |                                                                                                                                                                             |               |                |                   |                |               |             |        |        |        |        |                          |        |        |        |        |                    |        |        |        |        |                 |        |        |        |        |                    |        |        |        |        |                    |        |        |        |        |                   |        |        |        |        |                  |        |        |        |        |
| <b>Anticipated MPT Needs</b><br>AP33 Crossover: <input type="checkbox"/> AP34 Detour: <input type="checkbox"/> AP35 Half Width: <input type="checkbox"/> AP36 Lane Restriction: <input type="checkbox"/> AP37 Night Only: <input type="checkbox"/><br>AP38 Temporary Bridge: <input type="checkbox"/> AP39 None: <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                |                                                                                                                                                                                                                                                                                                                                                                     |                  |                                                                                                                                                                             |               |                |                   |                |               |             |        |        |        |        |                          |        |        |        |        |                    |        |        |        |        |                 |        |        |        |        |                    |        |        |        |        |                    |        |        |        |        |                   |        |        |        |        |                  |        |        |        |        |
| <input type="button" value="Close"/> <input type="button" value="Help"/> <input type="button" value="Show Projects..."/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                |                                                                                                                                                                                                                                                                                                                                                                     |                  |                                                                                                                                                                             |               |                |                   |                |               |             |        |        |        |        |                          |        |        |        |        |                    |        |        |        |        |                 |        |        |        |        |                    |        |        |        |        |                    |        |        |        |        |                   |        |        |        |        |                  |        |        |        |        |

## AP01 MPMS Project Number

(Old BMS Item O04)

### Description:

This item is used to record the MPMS project number.

### Procedure:

Enter the MPMS project number. Users must enter the MPMS Project number in order for BMS2 to interface with MPMS in order to extract data. This item is automatically displayed by the system for existing projects.

## AP02 Bridge Project Indicator

(Old BMS Item O05)

**Description:**

This checkbox field is used to indicate whether or not the project is a bridge project.

**Procedure:**

This item will be automatically entered by the system based on data that it obtains from MPMS. If the State Program Class in MPMS is BRPL (Bridge Replacement) or BRST (Bridge Restoration), the system will automatically check the box to indicate the project is a bridge project. Otherwise, the box will be left unchecked.

**Coding:**

- |           |                                         |
|-----------|-----------------------------------------|
| Unchecked | No, the project is not a bridge project |
| Checked   | Yes, the project is a bridge project    |

## AP03 Design - Bridge Bill Design Phase Indicator

(Old BMS Item O09)

**Description:**

This item is used to indicate whether a Design phase is included in a Bridge Bill Capital Budget.

**Procedure:**

This item will be automatically entered by the system based on data that it obtains from the MPMS.

**Coding:**

- |           |                                                                |
|-----------|----------------------------------------------------------------|
| Unchecked | Design phase is not included in the Bridge Bill Capital Budget |
| Checked   | Design phase is included in the Bridge Bill Capital Budget     |

## AP04 ROW/Utilities - Bridge Bill ROW/Utilities Phase Indicator

(Old BMS Item O09)

**Description:**

This item is used to indicate whether a ROW/Utility phase is included in a Bridge Bill Capital Budget.

**Procedure:**

This item will be automatically entered by the system based on data that it obtains from the MPMS.

**Coding:**

- |           |                                                                     |
|-----------|---------------------------------------------------------------------|
| Unchecked | ROW/Utility phase is not included in the Bridge Bill Capital Budget |
| Checked   | ROW/Utility phase is included in the Bridge Bill Capital Budget     |

## **AP05 Construction - Bridge Bill Construction Phase Indicator**

(Old BMS Item O09)

**Description:**

This item is used to indicate whether a Construction phase is included in a Bridge Bill Capital Budget.

**Procedure:**

This item will be automatically entered by the system based on data that it obtains from the MPMS.

**Coding:**

- |           |                                                                      |
|-----------|----------------------------------------------------------------------|
| Unchecked | Construction phase is not included in the Bridge Bill Capital Budget |
| Checked   | Construction phase is included in the Bridge Bill Capital Budget     |

## **AP06 Work Designated For**

**Description:**

This item is used to record the system where the type work is defined and stored.

**Procedure:**

Select the appropriate code from the dropdown list.

**Coding:**

- |   |                         |
|---|-------------------------|
| M | MPMS                    |
| S | SAP / Plant Maintenance |

## **AP07 ECMS Number - Engineering and Construction Management System (ECMS) Project Number**

(Old BMS Item O02)

**Description:**

This item identifies the old construction project number by District, County and Contract Number.

**Procedure:**

This item will be automatically entered by the system based on data that it obtains from the ECMS and MPMS.

**Coding:**

Digits are as follows:

- |     |                                   |
|-----|-----------------------------------|
| 1-2 | Engineering district              |
| 3   | County number within the district |
| 4-6 | Contract number                   |

## AP08 Federal Aid Project Number

(Old BMS Item O18)

**Description:**

This series of three fields is used to record the Federal Aid Project Number for the Bridge Improvement Project.

**Procedure:**

This item will be automatically entered by the system based on data that it obtains from MPMS.

**Coding:**

Federal Aid Project Number

## AP09 SAP WO Num - SAP Work Order Number

**Description:**

This item is used to record the work order number.

**Procedure:**

This item will be automatically entered by the system based on data that it obtains from SAP/Plant Maintenance.

**Coding:**

Work order number from SAP/Plant Maintenance.

## AP10 SAP WO Status - SAP Work Order Status

**Description:**

This item is used to display the status of the work order.

**Procedure:**

This item will be automatically entered by the system based on data that it obtains from SAP/Plant Maintenance.

**Coding:**

Work order status from SAP/Plant Maintenance.

## AP11 WBS - WBS Element Number

**Description:**

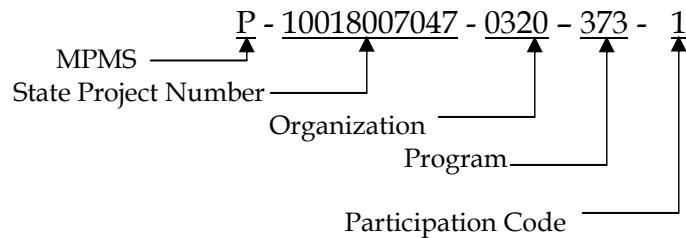
This item is used to record the Work Breakdown Structure (WBS) element number.

**Procedure:**

This item will be automatically entered by the system based on data that it obtains from SAP/Plant Maintenance.

**Coding:**

WBS element number from SAP/Plant Maintenance in the following format:



## **AP12 Construction - Twelve Year Program Indicator - Construction Phase**

(Old BMS Item O07)

**Description:**

This item is used to record the 12-Year program indicator in MPMS.

**Procedure:**

This item will be automatically entered by the system based on data that it obtains from the MPMS.

**Coding:**

- |   |                                 |
|---|---------------------------------|
| Y | Included in 12-Year Program     |
| N | Not Included in 12-Year Program |

## **AP13 Design - Twelve Year Program Indicator - Design Phase**

(Old BMS Item O07)

**Description:**

This item is used to record the 12-Year program indicator for the design phase in the PI System.

**Procedure:**

This item will be automatically entered by the system based on data that it obtains from the MPMS.

**Coding:**

The 12-Year Program Indicator is coded by 4 year time periods:

| <u>Coding</u> | <u>Time Period</u> |
|---------------|--------------------|
| 1             | First 4 years      |
| 2             | Second 4 years     |
| 3             | Third 4 years      |

## **AP14 ROW/Utility - Twelve Year Program Indicator - ROW/Utility Phase**

(Old BMS Item O07)

### **Description:**

This item is used to record the 12-Year program indicator for the ROW/Utility phase in the PI System.

### **Procedure:**

This item will be automatically entered by the system based on data that it obtains from the MPMS.

### **Coding:**

The 12-Year Program Indicator is coded by 4 year time periods:

- 1 First 4 years
- 2 Second 4 years
- 3 Third 4 years

## **AP15 State Project Number**

(Old BMS Item O04)

### **Description:**

This series of seven fields is used to record the state project number.

### **Procedure:**

This item will be automatically entered by the system based on data that it obtains from MPMS.

### **Coding:**

This item includes fields for the following numbers:

|              |          |
|--------------|----------|
| System       | 1 digit  |
| Route        | 5 digits |
| Subproject   | 1 digit  |
| Phase        | 1 digit  |
| Section      | 3 digits |
| Organization | 4 digits |
| Program      | 3 digits |

## **AP16 WBS - WBS Number**

### **Description:**

This item is used to record the SAP WBS number.

### **Procedure:**

This item will be automatically entered by the system.

### **Coding:**

The SAP WBS number.

## AP17 Contract Letting - Date of Construction Contract Letting (Old BMS Item O10)

### Description:

This item is used to record the actual date of the construction project contract letting.

### Procedure:

This item will be automatically entered by the system based on data that it obtains from MPMS.

### Coding:

Construction contract letting date in MM/DD/YYYY format:

|      |                      |            |                |
|------|----------------------|------------|----------------|
| MM   | 2 digit month        | 00/00/0000 | Not applicable |
| DD   | 2 digit day of month |            |                |
| YYYY | 4 digit year         |            |                |

## AP18 Contract Award - Date of Construction Contract Award (Old BMS Item O11)

### Description:

This item is used to record the actual date of the awarding of the construction project contract.

### Procedure:

This item will be automatically entered by the system based on data that it obtains from MPMS.

### Coding:

Construction contract award 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       |

## AP19 NTP - Date of Notice to Proceed (Old BMS Item O12)

### Description:

This item is used to record the actual date of the contractor's notice to proceed.

### Procedure:

This item will be automatically entered by the system based on data that it obtains from MPMS.

### Coding:

Date of notice to proceed in MM/DD/YYYY format:

|            |                      |
|------------|----------------------|
| MM         | 2 digit month        |
| DD         | 2 digit day of month |
| YYYY       | 4 digit year         |
| 00/00/0000 | Not applicable       |

## **AP20 Completion - Date of Project Completion**

(Old BMS Item O13)

### **Description:**

This item is used to record the actual date of project completion.

### **Procedure:**

This item will be automatically entered by the system based on data that it obtains from MPMS.

### **Coding:**

Date of project completion in MM/DD/YYYY format:

|            |                      |
|------------|----------------------|
| MM         | 2 digit month        |
| DD         | 2 digit day of month |
| YYYY       | 4 digit year         |
| 00/00/0000 | Not applicable       |

## **AP21 Open to Traffic - Date the Improved Structure Was Open to Traffic**

(Old BMS Item O14)

### **Description:**

This item is used to record the actual date that the improved structure was opened to traffic.

### **Procedure:**

This item will be automatically entered by the system based on data that it obtains from MPMS.

### **Coding:**

Date the improved structure was open to traffic in MM/DD/YYYY format:

|            |                      |
|------------|----------------------|
| MM         | 2 digit month        |
| DD         | 2 digit day of month |
| YYYY       | 4 digit year         |
| 00/00/0000 | Not applicable       |

## **AP22 Final Acceptance - Date of Construction Acceptance Certificate**

(Old BMS Item O15)

### **Description:**

This item is used to record the actual date of the final certification of work.

### **Procedure:**

This item will be automatically entered by the system based on data that it obtains from MPMS.

**Coding:**

Date of the final certification of work in MM/DD/YYYY format:

MM            2 digit month  
DD            2 digit day of month  
YYYY        4 digit year

00/00/0000   Not applicable

For items AP23 to AP29 users may only enter costs under the "Engineer Estimate" column. The "Rough Estimate" column contains the rough estimate study cost generated by the system through modeling. The "Estimated Cost" contains the estimated study cost from MPMS. The "Approved Cost" column contains the approved study cost from MPMS. The Rough Estimate, Estimated Cost and Approved Cost are automatically entered.

**AP23 Study - Study Costs**

(Old BMS Items O19 and O20)

**Description:**

This series of four fields is used to display the study costs for the project.

**Procedure:**

In the second column, record the study cost estimated by the Engineer.

**Coding:**

Cost to the nearest dollar.

**AP24 Preliminary Design - Preliminary Design Costs**

(Old BMS Items O19 and O20)

**Description:**

This series of four fields is used to display the preliminary design costs for the project.

**Procedure:**

In the second column, record the preliminary design cost estimated by the Engineer.

**Coding:**

Cost to the nearest dollar.

**AP25 Right of Way - Right-Of-Way Costs**

(Old BMS Items O19 and O20)

**Description:**

This series of four fields is used to display the right-of-way costs for the project.

**Procedure:**

In the second column, record the right-of-way cost estimated by the Engineer

**Coding:**

Cost to the nearest dollar.

**AP26 Utilities Costs**

(Old BMS Items O19 and O20)

**Description:**

This series of four fields is used to display the utilities costs for the project.

**Procedure:**

In the second column, record the utilities cost estimated by the Engineer.

**Coding:**

Cost to the nearest dollar.

**AP27 Final Design - Final Design Costs**

(Old BMS Items O19 and O20)

**Description:**

This series of four fields is used to display the final design costs for the project.

**Procedure:**

In the second column, record the final design cost estimated by the Engineer.

**Coding:**

Cost to the nearest dollar.

**AP28 Construction - Construction Costs**

(Old BMS Items O19 and O20)

**Description:**

This series of four fields is used to display the construction costs for the project.

**Procedure:**

In the second column, record the construction cost estimated by the Engineer.

**Coding:**

Cost to the nearest dollar.

## AP29 Other Costs

**Description:**

This series of four fields is used to display the other costs for the project.

**Procedure:**

In the second column, record any other costs estimated by the Engineer.

**Coding:**

Cost to the nearest dollar.

## AP30 Total Costs

(Old BMS Item O19)

**Description:**

This series of four fields is used to display the total costs for the project.

**Procedure:**

The second field contains the total cost estimated by the Engineer. The total cost field is calculated automatically by the system as the sum of items AP23 through AP29.

**Coding:**

Cost to the nearest dollar.

## AP31 Anticipated Environmental Clearance Level

**Description:**

This item is used to indicate the level of environmental clearance required for the project, or if there are significant environmental issues with the project.

**Procedure:**

Select the code from the dropdown list that describes the anticipated level of environmental clearance required for the project, or the significant environmental issues with the project.

**Coding:**

- 02 Categorical Exclusion Level 2
- 1A Categorical Exclusion Level 1A
- 1B Categorical Exclusion Level 1B
- EA Environmental Assessment
- ES Environmental Impact Statement

## AP32 ROW Needed? - Right-Of-Way Needed?

**Description:**

This checkbox field is used to indicate whether or not Right-Of-Way is needed for the project.

**Procedure:**

Check the box to indicate "Yes" if right-of-way is needed for the project. Otherwise, the box should remain unchecked.

**Coding:**

- |           |                                |
|-----------|--------------------------------|
| Unchecked | No, right-of-way is not needed |
| Checked   | Yes, right of way is needed    |

## AP33 Crossover - Crossover Required?

**Description:**

This checkbox field is used to indicate whether or not a crossover is required for the project.

**Procedure:**

Check the box to indicate "Yes" if a crossover is needed for the project. Otherwise, the box should remain unchecked.

**Coding:**

- |           |                                 |
|-----------|---------------------------------|
| Unchecked | No, a crossover is not required |
| Checked   | Yes, a crossover is required    |

## AP34 Detour - Detour Required?

**Description:**

This checkbox field is used to indicate whether or not a detour is required for the project.

**Procedure:**

Check the box to indicate "Yes" if a detour is needed for the project. Otherwise, the box should remain unchecked.

**Coding:**

- |           |                              |
|-----------|------------------------------|
| Unchecked | No, a detour is not required |
| Checked   | Yes, a detour is required    |

## AP35 Half Width - Half Width Required?

**Description:**

This checkbox field is used to indicate whether or not a half width is required for the project.

**Procedure:**

Check the box to indicate "Yes" if a half width is needed for the project. Otherwise, the box should remain unchecked.

**Coding:**

- |           |                                  |
|-----------|----------------------------------|
| Unchecked | No, a half width is not required |
| Checked   | Yes, a half width is required    |

## AP36 Lane Restriction - Lane Restriction Required?

### Description:

This checkbox field is used to indicate whether or not a lane restriction is required for the project.

### Procedure:

Check the box to indicate "Yes" if a lane restriction is needed for the project. Otherwise, the box should remain unchecked.

### Coding:

|           |                                        |
|-----------|----------------------------------------|
| Unchecked | No, a lane restriction is not required |
| Checked   | Yes, a lane restriction is required    |

## AP37 Night Only?

### Description:

This checkbox field is used to indicate whether or not night only work is required for the project.

### Procedure:

Check the box to indicate "Yes" if night only work is needed for the project. Otherwise, the box should remain unchecked.

### Coding:

|           |                                     |
|-----------|-------------------------------------|
| Unchecked | No, night only work is not required |
| Checked   | Yes, night only work is required    |

## AP38 Temporary Bridge - Temporary Bridge Required?

### Description:

This checkbox field is used to indicate whether or not a temporary bridge is required for the project.

### Procedure:

Check the box to indicate "Yes" if a temporary bridge is needed for the project. Otherwise, the box should remain unchecked.

### Coding:

|           |                                        |
|-----------|----------------------------------------|
| Unchecked | No, a temporary bridge is not required |
| Checked   | Yes, a temporary bridge is required    |

## AP39 None - None Required

### Description:

This checkbox field is used to indicate that none of the M&PT needs are required for the project.

**Procedure:**

Check the box to indicate that none of the M&PT items are needed for the project. Otherwise, the box should remain unchecked.

**Coding:**

- |           |                                      |
|-----------|--------------------------------------|
| Unchecked | M&PT needs are required as indicated |
| Checked   | None of the M&PT needs are required  |

## AP40 Project Class

**Description:** This is a 5-digit field used to record the project class.

**Procedure:** This item will be automatically entered by the system based on the data it obtains from the MPMS.

**Coding:**

|       |                                   |
|-------|-----------------------------------|
| ADDLN | Additional Lanes                  |
| AIRQ  | Air Quality                       |
| BKPED | Bicycle/Pedestrian                |
| RBRDG | Bridge Removal                    |
| BRPL  | Bridge Replacement                |
| BRST  | Bridge Restoration                |
| CNGST | Congestion Reduction              |
| DSCON | Design/Construction               |
| DSTR  | Disaster                          |
| EQUIP | Equipment                         |
| GMNT  | General Maintenance               |
| HRCT  | Highway Reconstruction            |
| HRST  | Highway Restoration               |
| ITS   | Intelligent Transportation System |
| LAND  | Land Acquisition                  |
| NALGN | New Alignment                     |
| PLAN  | Planning                          |
| PRVMT | Preventive Maintenance            |
| PT    | Public Transit                    |
| RF    | Rail Freight                      |
| RAILG | Rail Highway Grade Crossing       |
| REST  | Rest Area/Welcome Center          |
| SAFE  | Safety Improvement                |
| ENHNC | Transportation Enhancement        |
| WATER | Waterline                         |
| PRA   | Planning/Research/Administration  |
| MISC  | Miscellaneous                     |

## AP41 Project Status

**Description:** This is a 5-digit field used to indicate the current status of the proposed improvement project.

**Procedure:** This item will be automatically entered by the system based on the data it obtains from MPMS.

**Coding: Coding is as follows:**

|       |            |
|-------|------------|
| ACT   | Active     |
| CAND  | Candidate  |
| COMP  | Completed  |
| FINAL | Finalized  |
| HOLD  | Hold       |
| HIST  | History    |
| INC   | Incomplete |
| PROG  | Programmed |

There are other items stored in the BMS2 database but are not currently visible within BMS2. Refer to Appendix D for items that may be queried through Crystal Reports.

## VL Inventory - Location

The Inventory - Location screen captures and displays information about the location of a structure. The screen is accessed by clicking on the applet button on the Inspection Desktop. At the top of the screen is the Select Structure section.

The Primary Location section displays the location of the structure as entered on the Pontis Inspection screen on the Inventory -> ID/Admin tab. The Other Locations section is a list of additional latitude/longitude locations. An unlimited number of records can be entered in this section.

The Create button allows users to add Other Location records. Users may select one or more Other Location record 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.

### VL01 Latitude - Other Latitude of Bridge Location

#### Description:

This item is used to record additional entries for the latitude of the bridge. **The primary latitude should be entered in item 5A10.**

#### Procedure:

The latitude should be measured and entered to the nearest hundredth of a second. Latitude should be measured at the beginning of the bridge or at some other convenient point on the bridge.

**Coding:**

The latitude, in degrees, minutes, and seconds to the nearest hundredth of a second. See item 5A10 for examples.

## VL02 Longitude - Other Longitude of Bridge Location

**Description:**

This item is used to record additional entries for the longitude of the bridge. **The primary longitude should be entered in item 5A11.**

**Procedure:**

The longitude should be measured and entered to the nearest hundredth of a second. The longitude should be measured at the beginning of the bridge or at some other convenient point on the bridge.

**Coding:**

The longitude, in degrees, minutes, and seconds to the nearest hundredth of a second. See item 5A10 for examples.

## VL03 Location - Location of Structure

**Description:**

This item used to record the bridge location corresponding to the latitude and longitude coordinates in items VL01 and VL02, in a narrative form.

**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 that 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 corresponding to the latitude and longitude coordinates in items VL01 and VL02.

## 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.

New posting information can be added using the "Create" button. 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. The current posting record can be deleted by clicking on the "Remove" button. When the current posting record is removed, the prior posting record, if it exists, becomes the current record and the Last Post Date field is set to blanks. No past posting information can be removed.

| VP01<br>Status<br>Date | VP02<br>Posting<br>Status | VP03<br>Special<br>Restrictive<br>Posting | VP04<br>Posted<br>Weight Limit<br>ton | VP05<br>Posted Limit<br>Combination<br>ton | VP1<br>Post<br>Reason |
|------------------------|---------------------------|-------------------------------------------|---------------------------------------|--------------------------------------------|-----------------------|
|                        |                           |                                           |                                       |                                            |                       |
|                        |                           |                                           |                                       |                                            |                       |

(Note- Second half of screen shown on following page)

| VP04<br>Posted Weight Limit<br>ton | VP05<br>Posted Limit Combination<br>ton | VP06<br>Posting Reason | VP07<br>Field Conditions | VP08<br>Special Condition | VP09<br>AASHTO Impact Code |
|------------------------------------|-----------------------------------------|------------------------|--------------------------|---------------------------|----------------------------|
| -1                                 | -1                                      |                        |                          |                           |                            |

## VP01 Status Date

(Old BMS Items D16 and D17)

### Description:

This item is used to record the date that the corresponding status became effective.

### Procedure:

Enter the date that the corresponding status became effective. This item should be completed for a bridge which has been designated as closed or posted by entering a "C", "P" or an "R" in item VP02. If not known, provide a best estimate.

### Coding:

Date that the corresponding status became effective in MM/DD/YYYY format.  
Leave blank if bridge is not posted.

## \*VP02 Posting Status

(Old BMS Item D13)

### 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.

### 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)
- C 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 (if applicable), 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.

\*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

## **VP03 Special Restrictive Posting**

(Old BMS Item D14)

**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

(Old BMS Item D15)

### 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", "P" or "R" in item VP02.

### 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

(Old BMS Item D15)

### 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", "P" or "R" in item VP02.

### 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

(Old BMS Item D18)

### 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.

**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

(Old BMS Item D19)

**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

(Old BMS Item D20)

### 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

## VP09 Impact

(Old BMS Item D21)

### 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

## 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. 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<br>Date Applied | VA02<br>Paint Extent | VA03<br>Steel<br>ton | VA04<br>Surface Area<br>sq.ft |
|----------------------|----------------------|----------------------|-------------------------------|
| 12/1/1976            | [dropdown]           | 2,000                | -1                            |

**Paint Detail**

|                    |                     |                  |
|--------------------|---------------------|------------------|
| VA05 Primer:       | VA06 Intermediate:  | VA07 Finish:     |
| VA08 Paint Color:  | VA09 Num Coats:     | VA10 Thickness:  |
| VA11 Paint Volume: | VA12 Cleaning Type: | VA13 Paint Cost: |
| VA14 Notes:        |                     |                  |

### VA01 Date Applied - Date the Bridge Was Painted (Old BMS Item G09)

#### 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

(Old BMS Items G16 and E19)

### 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

(Old BMS Item G10)

### 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

(Old BMS Item G11)

### 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 (Old BMS Item G16)

### 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 (Old BMS Item G16)

### 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 (Old BMS Item G16)

### 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

(Old BMS Item G14)

### 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<br>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

(Old BMS Item G12)

### 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

(Old BMS Item G16)

### 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

(Old BMS Item G13)

**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

(Old BMS Item G15)

**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

(Old BMS Item G17)

**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

### 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.

## VM Inventory - Maintenance Responsibility

The Inventory - Maintenance Responsibility screen captures and displays information about parties responsible for maintaining various portions of a structure. The screen is accessed by clicking on the applet button on the Inspection Desktop. At the top of the screen is the Bridge Selection section. The next section, Maintenance Description, is capable of displaying an unlimited number of records.

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.

The screenshot shows a Windows application window titled "PennDOT BMS2 Inventory Applet". The window has a toolbar at the top with buttons for Metric, English, Help, Print, and Save. Below the toolbar is a menu bar with tabs: Location, Posting, Paint, Maintenance Responsibility (which is selected and highlighted in blue), Design, Notes, and Insp. Plan. The main area contains several input fields and a table. At the top of the main area, there are two text boxes: "6A23 Owner:" and "6A06 Agency Sub:". Below these are two more text boxes: "VM01 Legis Act Num:" and "VM02 Maint Resp Desc:". Underneath these fields is a section titled "Additional Maintenance Responsibility" containing a table with four columns: "VM03 Agency Responsible", "VM04 Portion", "VM05 PUC Docket Num", and "VM06 Order Date". The table currently has two rows, both of which have dropdown arrows in the "Agency Responsible" column. To the right of the table are two buttons: "Create" and "Remove". At the bottom left of the main area is a text box labeled "VM07 Notes:" with a small "ENDDATE" icon in the bottom right corner. The entire application window has a standard Windows border with minimize, maximize, and close buttons.

**VM01 Legis Act Num - Legislative Act Number which Transferred Ownership  
(Old BMS A21)****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  
(Old BMS A22)****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  
(Old BMS A23)****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**

(Old BMS A23)

**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**

(Old BMS A13)

**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

### 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

### 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.

## 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 is accessed by clicking on the applet button on the Inspection Desktop.

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.

**Superstructure Steel**

VD01 Design Method: [dropdown] VD02 Live Load Continuity: [dropdown]  
 VD03 Geometry: [dropdown]

**Superstructure Concrete**

VD04 Steel Beam Splice: [dropdown] VD05 Steel Types: [list box with Add Item and Delete Item buttons]

VD06 Vacuum Process: [dropdown] VD11 Design Tension Methods: [list box]

VD07 Strand Type: [dropdown] VD12 Void Types: [list box with Add Item and Delete Item buttons]

VD08 Comp Strength @ 28 days: [dropdown] PSI  
 VD09 Comp Strength @ Release: [dropdown] PSI

**VD10 Prestressed Splice Type**

Design: [dropdown] VD13 Strand Sizes: [list box with Add Item and Delete Item buttons]  
 Filler: [dropdown]  
 Through: [dropdown]

**Substructure**

VD14 Abutment Type

|                  |                                                                   |
|------------------|-------------------------------------------------------------------|
| Near: [dropdown] | VD16 Pier Types: [list box with Add Item and Delete Item buttons] |
| Far: [dropdown]  |                                                                   |

VD15 Abutment Foundation Type

|                  |                                                                              |
|------------------|------------------------------------------------------------------------------|
| Near: [dropdown] | VD17 Pier Foundation Types: [list box with Add Item and Delete Item buttons] |
| Far: [dropdown]  |                                                                              |

**Culvert**

| VD18 Opening Type | VD19 Length ft | VD20 Min Fill Height ft | VD21 Max Fill Height ft | VD22 Eff Width ft | VD23 Tie Type | V Flood |
|-------------------|----------------|-------------------------|-------------------------|-------------------|---------------|---------|
| [dropdown]        |                |                         |                         |                   |               |         |

**Expansion Joint**

| VD25 Exp Joint Type | VD26 Movement Class | VD27 Manufacture Code |
|---------------------|---------------------|-----------------------|
| [dropdown]          |                     |                       |

**Other**

VD28 Haunch Type: [dropdown] VD30 Bearing Types: [list box with Add Item and Delete Item buttons]  
 VD29 Special Pier Cap: [dropdown]

## VD01 Design Method

(Old BMS Item C04)

### 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?

(Old BMS Item C35)

### 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

(Old BMS Item C11)

### 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**

(Old BMS Item C24)

**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**

(Old BMS Item C12)

**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
- 99 Other

**VD06 Vacuum Process - Were the Prestressed Girders Cured by Vacuum Process?**

(Old BMS Item C31)

**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?**

(Old BMS Item C30)

**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**

(Old BMS Item C27)

**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**

(Old BMS Item C26)

**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**

(Old BMS Item C36)

**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:**

| <b>Design</b>                                | <b>Filler</b>                     | <b>Through</b>                           |
|----------------------------------------------|-----------------------------------|------------------------------------------|
| 0 Not applicable                             | 0 Not applicable                  | 0 Not applicable                         |
| 1 Butt joint                                 | 1 Dry joint<br>(no fill material) | 1 Mild spliced reinforcing thru joints   |
| 2 Butt joint with single large key           | 2 Mortar joint filler             | 2 Tendon thru joint                      |
| 3 Butt joint with multiple small keys        | 3 Epoxy joint filler              | 3 Additional diagonal tendons thru joint |
| 4 Spaced joint (butt)                        | 4 Concrete joint filler           | 4 Mechanical splice thru joint           |
| 5 Spaced joint (with single large key)       | 5 Other                           | 5 Acts as a hinge as in drop-in spans    |
| 6 Spaced joint (with multiple<br>small keys) |                                   | 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**

(Old BMS Item C29)

**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 1<sup>st</sup> field is used to enter the code for the first design tensioning method. The 2<sup>nd</sup> 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**

(Old BMS Item C33)

**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**

(Old BMS Item C28)

**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
- A 7/16" coated strand
- B 1/2" coated strands

**VD14 Abutment Type**

(Old BMS Item C37)

**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                                                                                                    | D | Other proprietary                                                 |
| 2 | Cantilever                                                                                              | E | Pile bent                                                         |
| 3 | Gravity Concrete                                                                                        | F | Reserved                                                          |
| 4 | Gravity Stone-masonry                                                                                   | G | Gabion                                                            |
| 5 | Counterfort                                                                                             | H | <u>VSL Retained Earth - MSE</u>                                   |
| 6 | Integral                                                                                                | I | <u>Reinforced Earth - MSE</u>                                     |
| 7 | Cellular                                                                                                | J | <u>Doublewall</u> (concrete modular wall)                         |
| 8 | Spill-through Abutment                                                                                  | K | Flexible anchored wall                                            |
| 9 | Other (describe in comments)                                                                            | L | Flexible non-anchored 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             |

**Examples:**

RC Cantilever:

|                |   |
|----------------|---|
| 2 - Cantilever | ▼ |
|----------------|---|

Pile supported pad on VSL wall:

|                        |   |
|------------------------|---|
| B - Pile supported pad | ▼ |
|------------------------|---|

Tied back soldier beam wall:

|                            |   |
|----------------------------|---|
| K - Flexible anchored wall | ▼ |
|----------------------------|---|

**VD15 Abutment Foundation Type**

(Old BMS Item C38)

**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 | Spread footing on <u>competent bedrock</u><br>*(see codes K and R) | K | Spread footings or culverts with an integral bottom on erodible bedrock(such as claystone, clay shales, some silt stone, shales and weathered bedrock) |
| B | Cast-in-place concrete piles                                       | L | Spread footings or culverts with an integral bottom on soils (sand-gravel, cobbles, silt and clay)                                                     |
| C | Precast concrete piles                                             | O | Other (describe in comment)                                                                                                                            |
| D | Prestressed concrete piles                                         | P | Foundation type has been researched. Information is unknown or not available with confidence                                                           |
| E | Steel H-piles                                                      | R | Footing is 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.

**VD16 Pier Types - Pier Material and Configuration**

(Old BMS Item C39)

**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 (describe in comments) |
| 7 | Encased structural steel                                         |                                |
| 8 | Concrete unknown, cannot determine type<br>(i.e., reinforcement) |                                |
| 9 | Other (describe in comments)                                     |                                |

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**

(Old BMS Item C40)

**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 | Spread footing on <u>competent bedrock</u><br>*(see codes K and R) | K | Spread footings or culverts with an integral bottom on<br>erodible bedrock(such as claystone, clay shales, some silt<br>stone, shales and weathered bedrock) |
| B | Cast-in-lace concrete piles                                        | L | Spread footings or culverts with an integral bottom on<br>soils (sand-gravel, cobbles, silt and clay)                                                        |
| C | Precast concrete piles                                             | O | Other (describe in comment)                                                                                                                                  |
| D | Prestressed concrete piles                                         | P | Foundation type has been researched. Information is<br>unknown or not available with confidence                                                              |
| E | Steel H-piles                                                      | R | Footing is on bedrock - erodibility cannot be<br>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                                                          |   |                                                                                                                                                              |

**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

**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

(Old BMS Item C06)

**Description:**

This item is used to record the length of a structure under fill.

**Procedure:**

Enter total length of a culvert barrel. 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.

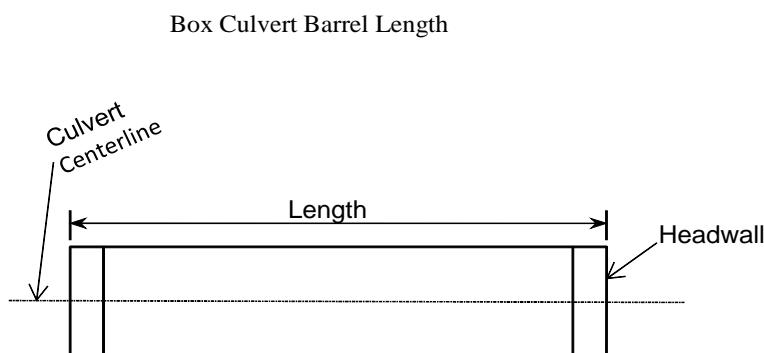


Figure 1. Plan view of culvert length measurement

**VD20 Min Fill Height - Minimum Fill Height Over Culvert****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****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****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.

**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**

(Old BMS Item C42)

**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****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**

(Old BMS Item C22)

**Description:**

This item indicates the type(s) of deck expansion 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**

(Old BMS Item C22)

**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**

(Old BMS Item C22)

**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   | Applicable for deck joints only. |
| 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    |                |                                  |

## VD28 Haunch Types

(Old BMS Item C32)

### Description:

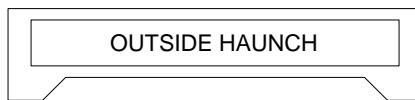
This item indicates the type of haunch in the prestressed beams.

### 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

(Old BMS Item C41)

### 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<br>(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

(Old BMS Item C23)

### 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)                                       | 99 | Other                                         |
| 11 | Neoprene (laminated)                                   |    |                                               |

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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 accessed by clicking on the Inventory applet button on the Inspection Desktop.

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.

PennDOT BM52 Inventory Applet

Bridge:

Metric English

Location Posting Paint Maint Resp Design **Drawings and Notes** Insp. Plan

**VN01 Design Exception Codes**

**VN02 Soil Boring Notes:**

**VN03 Test Description:**

**VN04 Storage Location:**

**VN05 Design Drawing Numbers**

Description:

**VN06 Shop Drawing Numbers**

Description:

**VN07 Repair Drawing Numbers**

Description:

## VN01 Design Exception

(Old BMS Item A12-A)

### 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

### 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

### 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

**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

(Old BMS Item A14)

**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

(Old BMS Item A15)

**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**

(Old BMS Item G03)

### **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.

## 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 accessed by clicking on the applet button on the Inspection Desktop. At the top of the screen is the Select Structure section.

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.

| Equipment ID | VI12 Type          | VI13 Quantity | VI14 Consumable          | VI15 Assigned To | VI16 Com |                                                                             |
|--------------|--------------------|---------------|--------------------------|------------------|----------|-----------------------------------------------------------------------------|
| 1            | A - Personnel Lift | 1             | <input type="checkbox"/> |                  |          | <input type="button" value="Create"/> <input type="button" value="Remove"/> |

### VI01 Min Crane Reach - Minimum Crane Reach Required

#### 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**

(Old BMS Item E05-A)

**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****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****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

(Old BMS Item A34)

### 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

## VI06 Type (Right) - Right Sidewalk Type

(Old BMS Item A34)

### 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

## VI07 Width (Left) - Left Sidewalk Width

(Old BMS Item A34)

### 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**

(Old BMS Item A34)

**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?**

(Old BMS Item A36)

**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?**

(Old BMS Item A36)

**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

### 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

(Old BMS Items E03 and S04)

### 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
- E A and C (Old BMS only)
- F A and D (Old BMS only)
- G A, B and D (Old BMS only)
- H B and C (Old BMS only)
- I B, C and D (Old BMS only)
- J C and D (Old BMS only)
- K Traffic Control
- L Boat
- M B and D (Old BMS only)
- N Lantern or Lighting
- O Other

## VI13 Quantity - Equipment Quantity

**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?

**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

**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

**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.

Items VI17 to VI24 are located on the Permits sub-tab.

**VI17 Permit #****Description:**

This item is used to record the permit # that is required for the inspection.

**Procedure:**

Enter the permit number.

**VI18 Type - Permit Type****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 Issuing Authority****Description:**

This item is used to record the name of the organization that issues the permit required.

**Procedure:**

Enter the name of the organization.

**VI20 POC – Point of Contact****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****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****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****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****Description:**

This item is used to record additional information regarding the permits.

**Procedure:**

Enter any notes concerning the permits.

## 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 accessed by clicking on the Inventory applet button on the Inspection Desktop. At the top of the screen is the Select Structure section.

### **VS01 Material Type - Sign Structure Material Type**

(Old BMS Item S12)

#### **Description:**

This item is used to indicate the kind of material for the sign structure.

#### **Procedure:**

Select the appropriate code from the dropdown list. Refer to item 6A26 for more information.

#### **Coding:**

- |                                      |                                     |
|--------------------------------------|-------------------------------------|
| 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         |

## VS02 Physical Type - Physical Makeup of Sign Structure

(Old BMS Item S12)

### Description:

This item is used to indicate the physical makeup of the sign structure's primary load carrying members.

### Procedure:

Select the appropriate code from the dropdown list. For sign structures select "9 – Other" from the dropdown list. Refer to item 6A27 for more information.

### Coding:

|   |                       |   |                                                                       |
|---|-----------------------|---|-----------------------------------------------------------------------|
| 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 places (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                                            |

## VS03 Interaction Type - Type of Span Interaction for Sign Structure

(Old BMS Item S12)

### Description:

This item is used to indicate whether or not there is composite action and continuity for the sign structure.

### Procedure:

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. Refer to item 6A28 for more information.

### 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)    |

## VS04 Configuration - Structural Configuration of Sign Structure

(Old BMS Item S12)

### Description:

This item is used to indicate the structural configuration of the sign structure.

### Procedure:

Select the type of sign structure being inventoried from the dropdown list.

**Coding:**

- 39 Cantilever
- 40 2 Chord Truss
- 41 3 Chord Truss
- 42 4 Chord Truss
- 43 Overhead Structure Shape or Tube
- 44 Overhead Truss with Multiple Spans
- 45 Structure Mounted Sign (Old BMS code – 99)
- 46 High Mast Light

**VS05 Mount Type - Mounting Type****Description:**

This item indicates the type or mounting for the sign structure.

**Procedure:**

Select the type of mount from the dropdown list.

**Coding:**

- G Ground Mounted
- S Structure Mounted

**VS06 Foundation Type****Description:**

This item indicates the type of foundation for the sign structure.

**Procedure:**

Select the appropriate foundation code from the dropdown list.

A coding of blank is not permitted for this item.

**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 Spread footing on <u>competent bedrock</u><br>* (see codes K and R) | K Spread footings or culverts with an integral bottom on erodible bedrock(such as claystone, clay shales, some silt stone, shales and weathered bedrock) |
| B Cast-in-lace concrete piles                                         | L Spread footings or culverts with an integral bottom on soils (sand-gravel, cobbles, silt and clay)                                                     |
| C Precast concrete piles                                              | O Other (describe in comment)                                                                                                                            |
| D Prestressed concrete piles                                          | P Foundation type has been researched. Information is unknown or not available with confidence                                                           |
| E Steel H-piles                                                       | R Footing is on bedrock – erodibility cannot be determined                                                                                               |
| F Steel pipe piles                                                    | X Information is not available at this time                                                                                                              |
| H Drilled caisson                                                     |                                                                                                                                                          |
| J Pedestals                                                           |                                                                                                                                                          |

## VS07 Manufacturer

**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

**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 Year Built - Year the Structure Was Built

(Old BMS Item A16)

**Description:**

This item is used to record the year the Structure was built.

**Procedure:**

Enter the 4 digit year in which the structure 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. This item may also be entered in Item 5A15, and after the data is saved, it will appear in VS09.

**Coding:**

The 4 digit year the structure was originally built.

## VS10 Reconstruct Yr - Year of Last Major Reconstruction on the Structure

(Old BMS Item A17)

**Description:**

This item is used to record the last year that a major reconstruction was performed on the structure.

**Procedure:**

Enter the last year in which major reconstruction was performed on the structure. 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 structure, code zeros for not applicable. This item may also be entered in item 5A16, and after the data is saved, it will appear in VS10.

For a structure 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.

**Coding:**

4 digit year in which major reconstruction was performed on the bridge.

**VS11 Number of Signs - Number of Signs Displayed on Sign Structure**

(Old BMS Item S13)

**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****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 County - County Code**

(Old BMS Item A01)

**Description:**

This item is used to record the county code for the county in which the structure 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       | 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       |                 |          |

**VS14 SR - State Route Number**

(Old BMS Item A01)

**Description:**

This item is used to record the 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.

**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.

**VS15 Segment - Segment Designation**

(Old BMS Item A01)

**Description:**

This item is used to record the 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.

**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.

**Case A:**

A 2 lane bi-directional or 1 or more uni-directional highway; code the designated segment number in the first segment occurrence.

**Case B:**

Two or more lanes in each direction on a bi-directional highway; code the designated segment number on the north or eastbound lanes in the first segment occurrence and the segment number of the south or west bound lanes in the second segment occurrence.

**VS16 Offset**

(Old BMS Item A01)

**Description:**

This item is used to record the distance in feet from the beginning of the segment to the beginning of the structure.

The priority of state route data is as follows: enter all state routes "on" the structure and then add all state routes "under" the structure. If no state route exists "on" the structure, add "under" state routes accordingly.

**Procedure:**

Enter the offset distance for the structure.

**Coding:**

Distance in feet from the beginning of the segment to the beginning of the structure.

**VS17 Distance from Rdwy - Distance From Roadway****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)

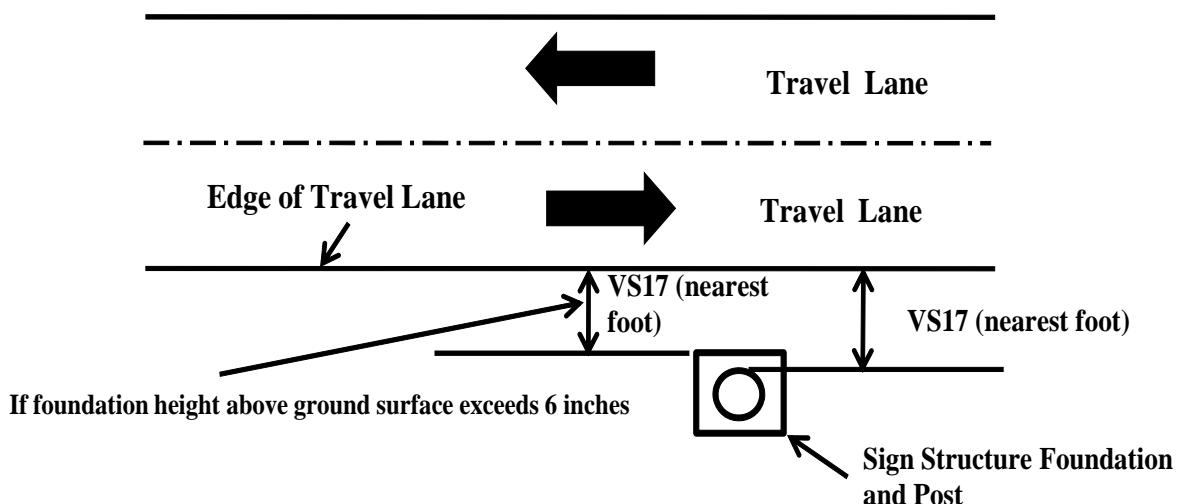


Figure 1 Measurement location for VS17

## **VS18 Direction from Rdwy - Direction From Roadway**

### **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**

### **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

### 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

### 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:

No      The mounting anchor bolt base is not grounded  
Yes     The mounting anchor bolt base is grounded

## VS2 Height - Height of High Mast Tower

### 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

### Description:

This item is reserved for future use.

## VS24 Alignment

### Description:

This item is reserved for future use.

## VS25 Total Area of Sign - Total Area of Signs on the Structure (Old BMS Item S05)

### 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

(Old BMS Item S19)

### 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:

| <u>Height</u> |       |
|---------------|-------|
| 50'-6"        | 50.50 |
| 30'-0"        | 30.00 |

## VS27 Total Horz Length - Length of Sign Structure

(Old BMS Item S21)

### Description:

This item is used to record the length of the sign structure to the nearest tenth of a foot.

### Procedure:

Enter the total length of the sign structure to the nearest tenth of a foot. Measure the length of the arm supporting the signs from center to center of end support shaft or column. In the case of a cantilever structure, measure the length of the arm supporting the signs from the center of the column to the end of the member.

**Coding:**

The total length of the sign structure in feet to the nearest tenth of a foot. For multiple span structures, enter the total length of spans.

**Examples:**

| <u>Length</u> |
|---------------|
| 50'-6"        |
| 30' 0"        |

**VS28 Number of Spans**

(Old BMS Item S20)

**Description:**

This item is used to describe the number of spans of the sign structure.

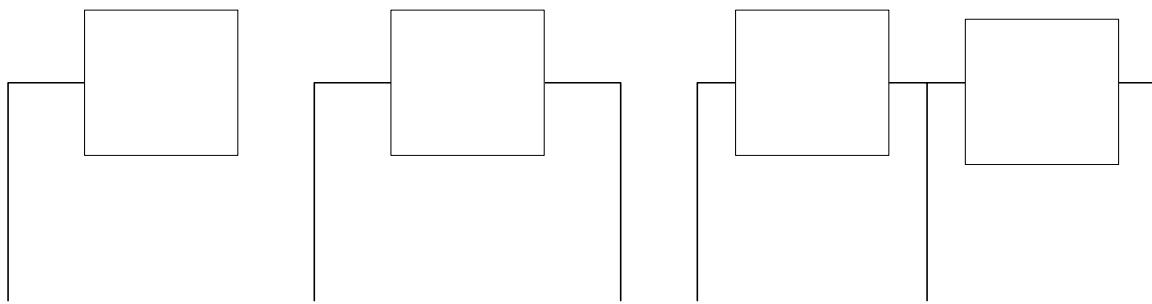
**Procedure:**

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



BLANK

ONE SPAN

TWO SPAN

**VS29****Number of Traf Lanes - Number of Lanes Under Sign Structure**

(Old BMS Items S20-A, B34, B11)

**Description:**

This item is used to record the number of traffic lanes located under the sign structure.

**Procedure:**

Enter the total number of traffic lanes located under the structure including ramps. This item may also be entered in item 5A19, and after the data is saved, it will appear in VS29.

**Coding:**

The number of traffic lanes under the structure. Round to the next whole number for one-half or more of a lane. DO NOT include additional lanes for large median widths which may be allowed for establishing inspection cost category.

**Examples:**

| <u>Number of Lanes</u> |
|------------------------|
| 2                      |
| (portion of ramp) 2.5  |

**VS30 Median Width Under - Median Width**

(Old BMS Item S21-A)

**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"              |

**VS31 Notes - Narrative Text****Description:**

This item is used to record information related to the structure that is not captured by other field, or general notes.

**Procedure:**

Record any narrative information related to the structure. Information from the old BMS AL screen was copied to this notes field. Districts shall edit the text as necessary so that all information relates to the sign structure.

**VS32 Owner - Owner or Principal Custodian of the Structure**

(Old BMS Item A20)

**Description:**

This item is used to record the owner or principal custodian of the structure.

**Procedure:**

Select the name of the owner or principal custodian of the structure 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. If more than one agency has equal maintenance responsibility, code one agency in the hierarchy of State, Federal, county, city, railroad, and other private. This item may also be entered in item 5A21, and after the data is saved, it will appear in VS32.

**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                                   |

**\*VS33 Maint Resp - Maintenance Responsibility for the Structure**

(Old BMS Item A22)

**Description:**

This item is used to describe, in a narrative form, who was responsible for maintenance of this structure.

**Procedure:**

Enter the name(s) of the agency responsible for maintenance of the structure. 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). This item may also be entered in item 6A23, and after the data is saved, it will appear in VS33.

**Coding:**

A narrative description of the agencies responsible for maintenance of the structure. Abbreviations should be used where necessary, but an attempt should be made to keep them meaningful.

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## 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 accessed by clicking on the Inventory applet button on the Inspection Desktop, and then selecting the Walls tab.

**Wall:** [Input Field] Metric English ? Print Back Forward Save

**Walls** Location Paint Maint Resp Notes Insp. Plan

**Wall Information**

**Structure Type**

|                        |                      |
|------------------------|----------------------|
| VW01 Material Type:    | VW11 Mount Type:     |
| VW02 Physical Type:    | VW12 Post Type:      |
| VW03 Interaction Type: | VW13 Year Built:     |
| VW04 Configuration:    | VW14 Reconstruct Yr: |

|                          |                                    |
|--------------------------|------------------------------------|
| VW05 Foundation Type:    | VW15 Architectural Forms:          |
| VW06 Backfill/Damping 1: | VW16 Rebar Protection:             |
| VW07 Backfill/Damping 2: | VW17 FCI: <input type="text"/> PSI |
| VW08 Historic Elig Info: | VW18 Support Info:                 |
| VW09 Manufacturer:       | VW19 Direction Info:               |
| VW10 Wall Use:           | VW20 Installed/Retrofitted:        |

**Measurements**

|                                                |                                               |
|------------------------------------------------|-----------------------------------------------|
| VW21 County - Begin:                           | End:                                          |
| VW22 SR - Begin:                               | End:                                          |
| VW23 Segment - Begin:                          | End:                                          |
| VW24 Offset - Begin:                           | End:                                          |
| VW25 Distance to Road: <input type="text"/> ft | VW28 Min Wall Height: <input type="text"/> ft |
| VW26 Slope: <input type="text"/>               | VW29 Max Wall Height: <input type="text"/> ft |
| VW27 Min Clearance: <input type="text"/> ft    | VW30 Total Length: <input type="text"/> ft    |
|                                                | VW31 Total Area: <input type="text"/> sq.ft   |

VW32 Notes:

**Management**

|                                       |
|---------------------------------------|
| VW33 Owner: <input type="text"/>      |
| VW34 Maint Resp: <input type="text"/> |

## VW01 Material Type - Wall Material

(Old BMS Item T08)

### Description:

This item is used to indicate the material makeup of the main load carrying member of the wall.

### Procedure:

Select the material makeup of the main load carrying member of the wall from the dropdown list.

### Coding:

- |                                      |                          |
|--------------------------------------|--------------------------|
| 1 Steel                              | 6 Masonry                |
| 2 Concrete (cast-in-place)           | 7 Stone                  |
| 3 Concrete (precast)                 | 8 Concrete Encased Steel |
| 4 Prestressed Precast Concrete (P/S) | 9 Other                  |
| 5 Timber                             |                          |

### Examples:

|                                            |                        |
|--------------------------------------------|------------------------|
| Timber Cribbing Retaining Wall             | 5 - Timber             |
| Precast Concrete Doublewall Retaining Wall | 3 - Concrete (precast) |
| Tied Back Soldier Beam Wall                | 1 - Steel              |

## VW02 Physical Type - Physical Makeup of Wall

(Old BMS Item T08)

### Description:

This item is used to indicate the physical makeup of the retaining wall or wingwall primary load carrying members.

### Procedure:

This item should be coded "9" for all walls.

## VW03 Interaction Type - Type of Span Interaction for Wall

(Old BMS Item T08)

### Description:

This item is used to indicate whether or not there is composite action and continuity for the retaining wall or wingwall.

### Procedure:

This item should be coded "9" for all walls.

## VW04 Configuration - Structural Configuration of Wall

(Old BMS Item T08)

### Description:

This item is used to indicate the structural configuration of the retaining wall or wingwall not integral with the abutment.

### Procedure:

Select the type of wall being inventoried from the dropdown list. If a combination of types exist, code the most critical one.

### Coding:

| BMS2 | Old BMS | Description                              | BMS2 | Old BMS | Description                               |
|------|---------|------------------------------------------|------|---------|-------------------------------------------|
| 61   | 01      | Cantilever                               | 69   | 09      | <u>Doublewall</u> (concrete modular wall) |
| 62   | 02      | Counterfort                              | 70   | 10      | Flexible Non-Anchored Wall                |
| 63   | 03      | Cribbing                                 | 71   | 11      | Flexible Anchored Wall                    |
| 64   | 04      | Gabion                                   | 72   | 12      | Concrete Modular Wall                     |
| 65   | 05      | Mechanically Stabilized Embankment (MSE) | 73   | 20      | Post and Panel Noise Wall                 |
| 66   | 06      | Tied Back                                | 74   | 21      | Offset Noise Barrier                      |
| 67   | 07      | <u>Reinforced Earth</u> (MSE)            | 75   | 22      | Offset Noise Barrier - <u>Fan Wall</u>    |
| 68   | 08      | <u>VSL Retained Earth</u> (MSE)          | 76   | 99      | Other Wall                                |

### Note:

Underscoring denotes a proprietary product.

### Examples:

Timber Cribbing Retaining Wall

63 - Cribbing ▾

Precast Concrete Doublewal Retaining Wall

69 - Doublewall (concre ▾

Tied Back Soldier Beam Wall

71 - Flexible Anchored ▾

## VW05 Foundation Type

### 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 | Spread footing on competent bedrock<br>* (see codes K and R) | K | Spread footings or culverts with an integral bottom on erodible bedrock(such as claystone, clay shales, some silt stone, shales and weathered bedrock) |
| B | Cast-in-lace concrete piles                                  | L | Spread footings or culverts with an integral bottom on soils (sand-gravel, cobbles, silt and clay)                                                     |
| C | Precast concrete piles                                       | O | Other (describe in comment)                                                                                                                            |
| D | Prestressed concrete piles                                   | P | Foundation type has been researched. Information is unknown or not available with confidence                                                           |
| E | Steel H-piles                                                | R | Footing is 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**

(Old BMS Item T11)

**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 | Course Aggregate, No. 57            |
| 12 | Granular Material        | 24 | Local Stone                         |
| 13 | Shale                    | 35 | <u>Geosynthetic Reinforced Soil</u> |
| 20 | Rock                     | 91 | Random Material                     |
| 21 | Course Aggregate, Type C | 99 | Other                               |
| 22 | Course Aggregate, No. 1  |    |                                     |

**Example:**

Backfill material is compacted soil with coarse aggregate No. 57 for drainage. Estimated percentage is 10% aggregate, 90% soil.

|           |   |
|-----------|---|
| 11 - Soil | ▼ |
|-----------|---|

## VW07 Backfill/Damping 2 - Secondary Backfill Material

(Old BMS Item T11)

**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 | Course Aggregate, No. 57            |
| 12 | Granular Material        | 24 | Local Stone                         |
| 13 | Shale                    | 35 | <u>Geosynthetic Reinforced Soil</u> |
| 20 | Rock                     | 91 | Random Material                     |
| 21 | Course Aggregate, Type C | 99 | Other                               |
| 22 | Course Aggregate, No. 1  |    |                                     |

**Example:**

Backfill material is compacted soil with coarse aggregate No. 57 for drainage. Estimated percentage is 10% aggregate, 90% soil.

23 - Course Aggregate, No. 57 

## VW08 Historic Elig Info - Historic Eligibility Information

**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

**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

(Old BMS Item T10)

**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 | Noisewall                                    |
| 4 | Bridge Abutment and Wingwall | 9 | Other                                        |

**Example:**

Retaining wall is a bridge abutment and wingwall.

It extends 200 feet from the bridge

▾

**VW11 Mount Type - Mounting Type****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****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 Year Built - Year the Wall Was Built**

(Old BMS Item A16)

**Description:**

This item is used to record the year the wall was built.

**Procedure:**

Enter the 4 digit year in which the wall 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 wall was built in 1997: 1997

**\*VW14 Reconstruct Yr - Year of Last Major Reconstruction on the Wall**

(Old BMS Item A17)

**Description:**

This item is used to record the last year that a major reconstruction was performed on the wall .

**Procedure:**

Enter the last year in which major reconstruction was performed on the structure. 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, code zeros for not applicable.

For a structure 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:

- 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.

**Coding:**

4 digit year in which major reconstruction was performed on the bridge.

**VW15 Architectural Forms - Were Architectural Forms Used?****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

### 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

## VW17 F'CI - Compressive Strength Concrete at 28 Days

### 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

### 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

### Description:

This item is used to record left, right, up (holding back the side of the hill) and down (supporting the roadway) information to be passed to RMS.

**Procedure:**

Select the code from the dropdown list that indicates the direction of the wall support.

**Coding:**

- |       |                         |
|-------|-------------------------|
| Left  | Support is to the left  |
| Right | Support is to the right |

**VW20 Installed/Retrofitted****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**

(Old BMS Item A01)

**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

(Old BMS Item A01)

### 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.

### 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

(Old BMS Item A01)

### 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.

### 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

(Old BMS Item A01)

### 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. Enter the offset distance at the end of the structure in Field 2.

### Coding:

Distance in feet from the beginning of the segment to the beginning and end of the structure.

## VW25 Distance to Road

**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

(Old BMS Item T12)

**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

**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

(Old BMS Item T04)

### 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.

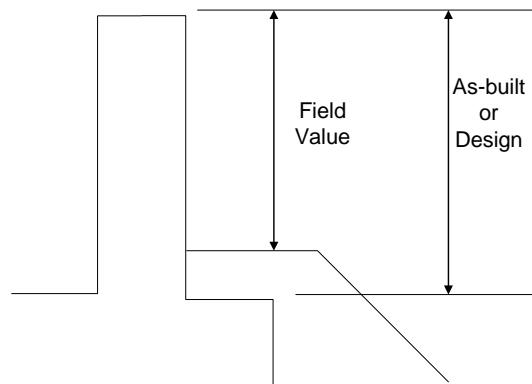
### Coding:

Minimum stem height in feet and inches\*.

#### Example

| <u>Wall Height</u> |
|--------------------|
| 14'-6"             |
| 8'-3"              |

VW28 and VW29



## VW29 Max Wall Height - Maximum Wall Height

(Old BMS Item T05)

### 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

| <u>Wall Height</u> |
|--------------------|
| 14'-6"             |
| 37'-10"            |

**VW30 Total Length - Total Length of Wall**

(Old BMS Item T06)

**Description:**

This item is used to record the total overall length of the wall.

**Procedure:**

Enter the total length of the wall to the nearest foot.

**Coding:**

The total length of the wall to the nearest foot. Prefix with zeros where necessary.

**VW31 Total Area - Approximate Area of the Wall**

(Old BMS Item T07)

**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 Notes - Narrative Text**

(Old BMS Items T18 to T24)

**Description:**

These are line items 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.

**\*VW33 Owner - Owner or Principal Custodian of the Wall**

(Old BMS Item A20)

**Description:**

This item is used to record the owner or principal custodian of the wall.

**Procedure:**

Select the name of the owner or principal custodian of the wall 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. If more than one agency has equal maintenance responsibility, code one

agency in the hierarchy of State, Federal, county, city, railroad, and other private. This item may also be entered in item 5A21, and after the data is saved, it will appear in VW33.

**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                                   |

**\*VW34 Maint Resp - Maintenance Responsibility for the Wall**

(Old BMS Item A22)

**Description:**

This item is used to describe, in a narrative form, whom was responsible for maintenance of this wall.

**Procedure:**

Enter the name(s) of the agency responsible for maintenance of the wall. 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). This item may also be entered in item 6A23, and after the data is saved, it will appear in VW34.

**Coding:**

A narrative description of the agencies responsible for maintenance of the wall. Abbreviations should be used where necessary, but an attempt should be made to keep them meaningful.

**Examples:**

A wall is entirely maintained by the Pennsylvania Department of Transportation.

PennDOT

## VO - Miscellaneous Other Structure

The Miscellaneous Other Structure Inventory screen allows users to view, and/or edit information related to structures other than signs, high mast lights, noise walls, and retaining walls, which are already handled by their respective screens. This screen is accessed by selecting a structure on the Miscellaneous Structure Layout. At the top of the screen is the Select Structure section.

### **VO01 Year Built - Year the Structure Was Built**

(Old BMS Item A16)

#### **Description:**

This item is used to record the year the Structure was built.

#### **Procedure:**

Enter the 4 digit year in which the structure 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 structure was originally built.

## \*VO02 Type of Service On - Type of Service On Structure (Old BMS Item A26)

### Description:

This item indicates the type of service on the structure.

### Procedure:

Select the type of service carried by the structure from the dropdown list.

### Coding:

Type of service carried by the structure.

- 0 Private Road/Other
- M Miscellaneous Structure
- T Tunnel

### Note:

Streets should be treated as highways, not a private road or other. A private road is a highway, road or street, not under public authority jurisdiction, not maintained by public authority and not open to the public.

### Examples:

Coal Chute:

Tunnel:

## \*VO03 Type of Service Under - Type of Service Under Structure (Old BMS Item A26)

### Description:

This item indicates the type of service under the structure.

### Procedure:

Select the type of service under the structure from the dropdown list.

### Coding:

Type of service passing under the structure.

- |                                |                                 |
|--------------------------------|---------------------------------|
| 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:

Streets should be treated as highways, not a private road or other. A private road is a highway, road or street, not under public authority jurisdiction, not maintained by public authority and not open to the public.\

**Example:**

Tunnel:

|           |                                                                                   |
|-----------|-----------------------------------------------------------------------------------|
| 1 Highway |  |
|-----------|-----------------------------------------------------------------------------------|

**VO04 Location Info - Location Information**

(Old BMS Item A06)

**Description:**

This item is used to record information on the location of the structure.

**Procedure:**

Enter location information for the structure in narrative form.

**VO05 Notes****Description:**

This item is used to record any narrative information that the inspector feels is necessary or may assist in the classification of the structure.

**Procedure:**

Record any narrative information that is necessary to identify the structure. Narrative data from the old BMS AL screen has been stored in this item. Districts should edit data as necessary.

**\*VO06 Owner - Owner or Principal Custodian of the Bridge**

(Old BMS Item A20)

**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                      | 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                                   |

## VO07 Maint Resp - Maintenance Responsibility for Bridge

(Old BMS Item A23)

### Description:

This item indicates which agency is responsible to maintain what portion of the bridge.

### Procedure:

This item will be automatically filled in by the system based on information entered on the Inventory Applet - Maintenance Responsibility tab. This item should not be changed, but the value should be confirmed.

This code represents the type of agency that has primary responsibility for maintaining the structure. If more than one agency has equal maintenance responsibility, code one agency in the hierarchy of State, Federal, county, city, railroad, and other private.

The inspection file should contain a detailed description of responsibility pertinent to spans and span elements.

### 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                                   |

### Example:

Bridge with substructure maintained by PennDOT and superstructure maintained by a railroad:



## IA Inspection - Safety Features

This screen captures and displays information related to safety features of structures. The screen is accessed by clicking on the applet button on the Inspection Desktop. The security for this screen is the same as that of the Pontis Bridge Inspection screen.

The screenshot shows a window titled "PennDOT BMS2 Inspection Applet". At the top, there are fields for "Bridge:" and "Inspections (11):", a radio button for "Metric" or "English", and several icons for help, search, and save. Below this is a toolbar with tabs: "Safety Features" (which is selected), "Load Rating", "FracCrit", "Underwater", "Signing", and "Comments". A sub-field "5C08 Posted Speed Limit:" is shown with a dropdown menu containing "mph". The main area is titled "Safety Features" and contains a table with three columns: "Feature", "IA01 Location", and "IA02 Adequacy". The "IA03 Description" column is empty. The table rows list four safety features: "1 - Railing", "2 - Transition", "3 - Approach Guiderail", and "4 - Approach railend", each with dropdown menus for location and adequacy.

| Feature                | IA01<br>Location                 | IA02<br>Adequacy                 | IA03<br>Description |
|------------------------|----------------------------------|----------------------------------|---------------------|
| 1 - Railing            | <input type="button" value="▼"/> | <input type="button" value="▼"/> |                     |
| 2 - Transition         | <input type="button" value="▼"/> | <input type="button" value="▼"/> |                     |
| 3 - Approach Guiderail | <input type="button" value="▼"/> | <input type="button" value="▼"/> |                     |
| 4 - Approach railend   | <input type="button" value="▼"/> | <input type="button" value="▼"/> |                     |

### IA01 Location

**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.

**Coding:**

- 1 Left
- 2 Right
- 3 Near Left
- 4 Near Right
- 5 Far Left
- 6 Far Right

## \*IA02 Adequacy - Adequacy of Traffic Safety Features

(Old BMS Item E28-A)

### Description:

This item indicates the adequacy of bridge railings, transitions, approach guiderail, and approach rail ends. **The ratings entered in these fields will automatically fill in items 4A03, 4A04, 4A05 and 4A06 on the Inspection - Appraisal screen by the system.**

### 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 safety 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.

#### 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.

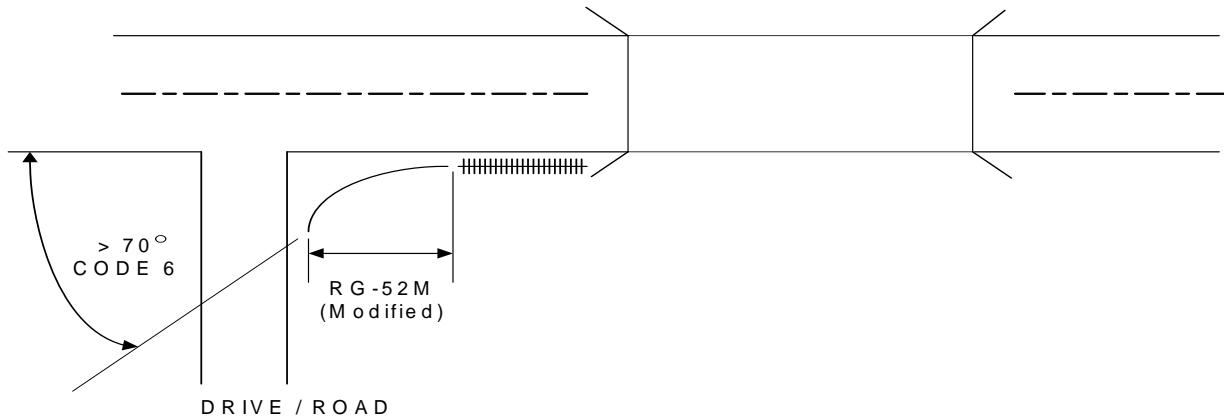
Reference RC-57M and RC-58M for Tapered Concrete End Treatments and code as follows. Where a sloped end Jersey barrier section (RC-58) without approach guiderail is used adjacent to the roadway, the coding should be 8222. This is because a blunt end impact is possible whether or not the roadway section 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
- D (ET-2000) Extruder terminal
- 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
- N ET Plus
- 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.
  - When structure is under fill where roadway guiderails 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 (see current standards).
- 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.
- N When highway traffic does not use the bridge (i.e., pedestrian or railroad bridge over a highway)

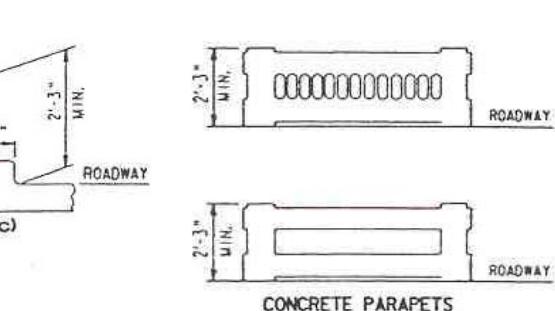
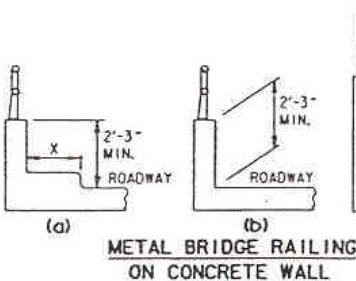
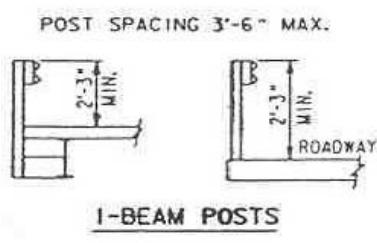
In cases where all of these safety features do not exist, each element must still be coded. Appraise the adequacy of the existing features or lack of them in meeting current standards and criteria.

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



\*\* CODE 6: GOOD CONDITION (non-standard)

NOTE:  
IF THE STRENGTH OF RAIL IS QUESTIONABLE, OR ON A HIGHWAY WITH HIGH ADT, OR POST SPACING GREATER THAN 3'-6" OR RAIL HEIGHT LESS THAN 2'-3", CODE 4

BC-738M dated 1/2/96  
DISCONTINUED 12/24/99

\*\*CODE 6

\*\*CODE 8: IF  $X \geq 36"$ , CURB HEIGHT  $\geq 8"$  AND SPEED LIMIT  $< 40$  MPH  
ALSO SEE BD-601M FOR SIMILAR CONFIGURATION

\*\*CODE 6: IF  $X \geq 36"$ , CURB HEIGHT  $< 8"$  AND SPEED LIMIT  $< 40$  MPH

\*\*CODE 4: IF  $9" < X < 36"$  AND SPEED LIMIT  $< 40$  MPH

\*\*CODE 2: IF SIDEWALK IS UNPROTECTED AND SPEED LIMIT IS  $\geq 40$  MPH

NOTE: SIDEWALK PROTECTION REQUIRED BY REGULATION FOR SPEEDS  $\geq 40$  MPH

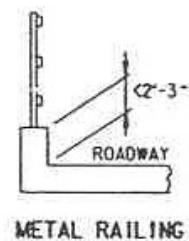
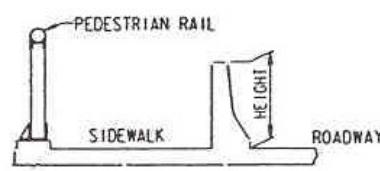
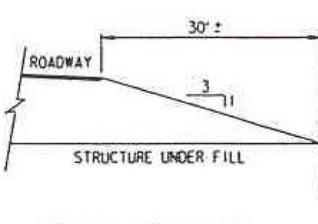
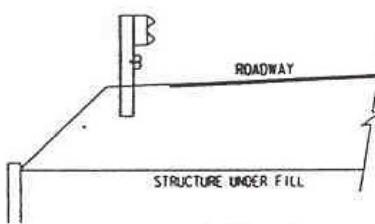
(b) and (c)

\*\*CODE 6: GOOD CONDITION

NOTE:

THERE IS NO CURRENT STANDARD FOR STRUCTURE MOUNTED BRIDGE RAIL WHEN NBIS L.T.  $> 20$  FT.

\*\*REDUCE CODES 8, 6, AND 4 BY ONE IF DAMAGED OR DETERIORATED



CODE 8: STRUCTURE UNDER FILL WHERE ROADWAY GUIDERAILS ARE CURBED ACROSS THE STRUCTURE

CODE 8: IF SLOPE IS FLATTENED AND NO GUIDERAIL FEATURE IS REQUIRED

\*\*CODE 8: IF HEIGHT = 42" WITH LOADING = PL-3

\*\* CODE 6: IF  $32" \leq$  HEIGHT  $< 42"$  WITH LOADING  $\leq$  PL-3  
OR  
IF HEIGHT  $\geq 42"$  WITH LOADING  $<$  PL-3

CODE 3:  
FOR PIPE RAILING OR CABLE SYSTEM

NOTE: Refer to current standard drawing BD's-601M, BD-609M, BD-610M, BD-615M, BD-617M, BD-618M  
\*\*REDUCE CODES 8, 6, AND 4 BY ONE IF DAMAGED OR DETERIORATED

**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:**

Provide approach end guiderail treatment 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.

**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****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 accessed by clicking on the PA Inspection applet button on the Inspection Desktop. At the top of the applet screen is the Load Rating tab.

The Load Rating screen provides the ability to create or remove load ratings from the set 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 Pontis Appraisal tab (Load Ratings sub-tab). The load rating values in the Pontis fields are overlayed 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 rating method data (BMS2 items IR04 through IR19). 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 in BMS2 is incorrect. Due to database restrictions, users cannot simply edit the most recent calculation date. 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. During data conversion for BMS2, only calculation dates stored in eForms were transferred to item IR03. If the most recent inspection from eForms did not contain a calculation date, the inspection date was also used as the calculation date (IR03) and Rating Approval Date (IR02). Old BMS did not have data fields to store the load rating calculation date.

BMS2 is capable of storing several complete load rating sets for each bridge. Each inspection can only have one “official” load rating set that will be used for NBI and Pontis purposes. When entering new load rating sets into BMS2, the “official” 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 Applet, Load Rating Tab:

1. Establish a new Calculation Date (IR03) for the load rating set by clicking the "Generate New Rating Set" button:
  - Enter the date the new load rating was performed into Calculation Date field (IR03).
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 select and delete more than 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 dataset 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.
  - 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 dataset 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.
  - Link the load rating dataset to that inspection date. **An asterisk in the IR02 Calc Date will indicate the "official" load rating for the inspection.** This "official" load rating data will be used for all Pontis and NBI calculations for that inspection.
  - De-link any other load rating dataset previously associated to that inspection.
  - Subsequent inspections created through BMS2 or iForms will also be initially linked to the last "official" load rating dataset.
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 official load rating.
- A second rating set may be needed for an inspection if loading has 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. BQAD 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 occur to the loading for the bridge 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 Due to Loading Change**  
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 Initiated

If bridge member conditions change, re-inspect and follow normal procedure outlined above.

## IR01a Load Rating Review Recommended

### 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.

### Coding:

Unchecked  
Checked

A new analysis is not recommended  
A new analysis is recommended

## IR01b Reviewer Action

### 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 Reqd - 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 Load Change - Re-rating is required due to changes other than inspection findings
- 6 Re-Rate Load Comp - Re-rating due to load change is complete

**Example 1:** The previous inspection had Item IR01A unchecked and Item IR01b had a value of "1 – Re-rating Not Reqd". 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 Reqd". For the current inspection, an inspector does not check Item IR01a. Item IR01b will stay as "1 – Re-rating Not Reqd".

## IR02 Rating Date

### Description:

This item indicates the date the ratings were performed, and ties the calculation date (Item IR03) to the inspection date.

### Procedure:

This item is automatically entered from Item IR03 when the user assigns the rating set to the inspection by clicking on the "Assign Rating to Inspection" button.

## IR03 Calc Date - Calculation Date

### 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 16<sup>th</sup>, 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**

(Old BMS Items E30 and E31)

**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 "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" 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:****Type of Loading**

- 1 H Loading
- 2 HS Loading
- 3 Alternate Interstate Loading
- 4 Type 3 Unit
- 5 Type 3S2 Unit
- 6 Type 3-3 Unit
- 7 Railroad Loading
- 8 Pedestrian or Special Loading (non-highway bridges); ML80 (highway bridges)
- 9 Gross Load Only Given
- 0 TK527

For bridges with 2 or more lanes restricted to "One truck at a time" (item VP02="R"), ratings for 1 lane of HS and ML80 should use the following code values:

- A H Loading
- B HS Loading
- C ML80 Truck

## IR05 NBI

### 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 load type is the NBI Rating. This item designates the load rating that was stored in the sixth subfield (LF Rating) for old BMS items E30 and E31.

### Coding:

- 0 Not an NBI Rating
- 1 NBI Rating

## IR06 Load Rating Meth - Rating Method

(Old BMS Item E32)

### 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:

- 1 Working Stress Method
- 2 Load Factor Method
- 3 Level 2 Analysis
- 4 Test Loading
- 5 Other
- 6 LRFD Method
- 7 Engineering Judgment

## IR07 Ctrl Memb Type - Type of Structural Member that Controls the Inventory Rating

(Old BMS Item E33)

### 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)
- 2 Floorbeam (transverse member)
- 3 Hanger
- 4 Tension member is a truss or similar structure
- 5 Deck
- 6 Substructure
- 9 Other

## IR08 Fatig Stress Cat - Fatigue Stress Category of the Controlling Member

(Old BMS Item E34)

### 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 F – Category as determined from structural analysis computations using the current AASHTO Standard Specifications for Highway Bridges.

- |   |          |   |                |
|---|----------|---|----------------|
| 1 | A        | 7 | Reserved       |
| 2 | B        | 8 | E              |
| 3 | B'       | 9 | E'             |
| 4 | C        | 0 | F              |
| 5 | Reserved | N | Not applicable |
| 6 | D        |   |                |

## IR09 Fatig Load Type - Type of Loading that Controls the Fatigue Inventory Rating

(Old BMS Item E35)

### 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)

(Old BMS Item E30)

### 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 Maintenance Inspection of Bridges, 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 Maintenance Inspection of Bridges.

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" 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.

\*Temporary condition is to be identified in item 5E03.

### Coding:

Inventory rating in Tons.

## \*IR11 Operating Rating

(Old BMS Item E31)

### 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 Maintenance Inspection of Bridges. 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 Maintenance Inspection of Bridges.

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" 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

\*Temporary condition is to be identified in item 5E03.

### Coding:

Operating rating in Tons.

**IR12 Govern Crit Inv - Governing Criteria – Inventory**  
(Old BMS Item E32)**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**  
(Old BMS Item E32)**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**  
(Old BMS Item E38)**Description:**

This item is used to record the year of the AASHTO Manual for Maintenance Inspection of bridges. Use year of “interim specifications” if it governs.

**Procedure:**

Enter the 4 digit year.

**Note:**

Current adopted AASHTO Inspection Manual: Manual for Condition Evaluation of Bridges (1994)  
Second Edition as revised through 2002 interims.

**Example:**

Year 1994: 1994

## IR15 AASHTO Spec Yr - Year of AASHTO Specifications Used in Determining Ratings

(Old BMS Item E37)

### 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: LRFD Bridge Design Specifications, 4<sup>th</sup> ed., as revised through 2007 interims.

### Example:

Year 1994:

## IR16 Engineer

### 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

### 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

(Old BMS Item E36)

### 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

### Description:

This item is used to record notes about the load rating.

### Procedure:

Enter notes about the load rating in narrative form.

## IF Inspection - Fracture Critical

The screen captures and displays fracture critical inspection data for structures. The screen is accessed by clicking the applet button on the Inspection Desktop. Security for this screen is the same as that of the Pontis Bridge Inspection screen. 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. 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**

(Old BMS Item J09)

#### **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:

1 / Type=M

The FCM detail is located on Pier 2:

P02 / Type=P

## IF02 FC Member Type - Member Type

### 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
- 02 Suspended Hanger Assembly
- 03 Truss - Bottom Chord
- 04 Truss - Diagonal
- 05 Truss - Top Chord
- 06 Tied Arch
- 07 Cable
- 08 Cross Girder
- 09 Steel Pier
- 10 Tension Member

## IF03 FC Member - Fracture Critical Member

(Old BMS Item J10)

### 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 L<sub>3</sub>L<sub>4</sub>:

L3L4

The FCM is the upstream welded plate girder of a two-girder bridge:

US GR TENSION ZONE

## IF04 Member Detail - Fracture Critical Detail

(Old BMS Item J11)

### 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**

(Old BMS Item J12)

**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
- D
- E
- E'
- F (No longer valid)

**IF06 Member Detail Condition - Fracture Critical Member Detail Condition**

(Old BMS Item J13)

**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

## 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.

**Note that the IN screen fields marked with an "(SC)" are required for each substructure unit in order to re-calculate the Scour Critical Bridge Indicator (SCBI) value.**

**PennDOT BMS2 Inspection Applet**

**Bridge:** 46002300100000    **Inspections (14):** 01/10/2008     Metric  English   

Safety Features | Load Rating | FracCrit | **Underwater** | Signing | Comments |

|                                               |                                                                                                                                                                                         |                                     |
|-----------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| 7A03 Primary Insp Type: R - Regular (routine) | IU00a UW Reviewer Action: <input style="width: 150px; height: 20px; border: none; background-color: white; border-bottom: 1px solid black; padding: 0 5px;" type="button" value="..."/> | 4A08 SCBI: 4 - Stable, needs action |
| 7A09 Inspection Freq: 24 Months               | IU01 Recalculate SCBI: <input type="checkbox"/> IU02 Num Units: <input type="text" value="1"/>                                                                                          | IU03 SCBI Source: 0 - observed      |

IU00b Review Comments:

**SCBI** | Sub Units | Other | **Calculate**

|                                                   |                                                                   |
|---------------------------------------------------|-------------------------------------------------------------------|
| IU04 Overall SCBI: <input type="text" value="0"/> | IU06 Stream Bed Material: A4 - Alluvium/advanced                  |
| IU05 Total Sar: 0                                 | IU07 Stream Bed Material Desc: Cobbles / Gravel / Sand / Boulders |

**SAR Calculation Data:**

|                                                  |                                                           |                                                          |
|--------------------------------------------------|-----------------------------------------------------------|----------------------------------------------------------|
| IU08 Debris Potn: <input type="text" value="0"/> | IU09 Trapping Potn: <input type="text" value="0"/>        | IU10 Pressure Flow: <input type="text" value="0"/>       |
| IU11 NAB Loc: 1 - Left                           | IU12 FAB Loc: 2 - Right                                   | IU13 US Left WW Presence: <input type="text" value="0"/> |
| IU14 Condition: <input type="text" value="0"/>   | IU15 US Right WW Presence: <input type="text" value="0"/> | IU16 Condition: <input type="text" value="0"/>           |
| IU17 Horizontal Debris Start: 0                  | IU18 Horizontal Debris End: 0 (0% = LAB to 100% = RAB)    |                                                          |
| IU19 Vert Debris Start: 0                        | IU20 Vert Debris End: 0 (0% = Streambed to 100% = Beam)   |                                                          |

**Current Countermeasures:**  
There is no Current CounterMeasure data for this structure. Use the [Create] button to create a new record.

**Potential Countermeasures:**  
There is no Potential CounterMeasure data for this structure. Use the [Create] button to create a new record.

**Sub Unit SCBI Data:**

| IN01     | IN12           | IN13             | IN05         | IN19                     | IN04 Change Since Last Insp | IN15 Stream Bed Material | IN03 Scour Rating    | IU27      | IU2     |
|----------|----------------|------------------|--------------|--------------------------|-----------------------------|--------------------------|----------------------|-----------|---------|
| Sub Unit | Pier/Abut Type | Foundation Type  | Scour Hole   | Movement Ind             |                             |                          | Scour Rating         | SCBI Code | SCI Cas |
| FAB      | 6 - Stone M    | 5 - Not Obscured | 6 - Advanced | <input type="checkbox"/> | 6 - Minor                   | A4 - Alluvium            | 4 - Adv w/scour hole |           |         |
| P01      | 6 - Stone M    | 5 - Not Obscured | 6 - Advanced | <input type="checkbox"/> | 5 - Medium                  | A4 - Alluvium            | 4 - Adv w/scour hole |           |         |
| NAB      | 6 - Stone M    | 5 - Not Obscured | 9 - None     | <input type="checkbox"/> | 8 - None                    | A4 - Alluvium            | 4 - Adv w/scour hole |           |         |

## IU00a Underwater Reviewer Action

(Reserved for Future Use)

## IU00b Review Comments

(Reserved for Future Use)

## IU01 Recalculate Scour Critical Bridge Indicator (SCBI)

### Description:

This checkbox field indicates whether or not the inspector recommends that the SCBI for the structure to be recalculated. The actual recalculation will be performed by the District.

### Procedure:

Check the box to indicate that the SCBI should be recalculated for this structure. Otherwise, leave the box unchecked.

### Coding:

- |           |                                           |
|-----------|-------------------------------------------|
| Unchecked | The SCBI does not need to be recalculated |
| Checked   | The SCBI needs to be recalculated         |

## IU02 Num Units - Number of Units Inspected

(Old BMS Item W14)

### Description:

This item is used to record the number of units of the bridge that received an underwater 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 inspection.

### Coding:

Enter the number of piers, abutments and/or culverts that were inspected.

### Example:

A bridge having 10 piers was inspected. Five of the piers were inspected by divers: 5

## IU03 SCBI Source

### 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 scour for the structure. Only one of the two options can be chosen at a time for a specific structure.

The District must make any necessary changes to the existing data.

**Coding:**

- C Calculations/H&H Analysis
- O Observed

## IU04 Overall SCBI - Observed Scour Assessment (OSA)

**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 District is responsible for performing this calculation, usually based on the inspector's recommendation.

**Coding:**

Observed Scour Assessment.

## IU05 Total SAR - Scour Assessment Rating (SAR)

**Description:**

This display only item indicates the Scour Assessment Rating (SAR) based on the current inspection data.

**Procedure:**

This field is automatically calculated by the system when the "Calculate" button is clicked. The District is responsible for performing this calculation, usually based on the inspector's recommendation.

**Coding:**

Scour Assessment Rating.

## IU06 Stream Bed Material

(Old BMS Item W07)

**Description:**

This two part item correlates the stream bed material (native or paved) with its potential for general scour.

**Procedure:**

**1<sup>st</sup> field:** select the predominant type of stream bed material under the bridge from the dropdown list.

**2<sup>nd</sup> field:** select the 2<sup>nd</sup> most common type of streambed material from the dropdown list.

**Coding:**Countermeasures-Paved Streambeds:

C8 Streambed paved with concrete gabions or grout bags in good condition and adequate to resist scour.  
C7 Streambed paved with concrete gabions, grout bags or placed rock in good condition. Minor problems may exist. Scour protection is adequate.

Bedrock Streambeds (not riprap):

R9 non-erodible rock. Minor faulting or weathering may be present. Deeper holes may exist in mid-channel. Only minor scour near substructures.

R8 Erodible rock. Rock may be faulted, weathered and/or soft. Deeper holes may exist in mid-channel. Near substructures only minor scour may be present.

R7 Erodible rock. More advanced weathering and/or faulting may be present. Minor or advanced scour is present and may be adjacent to substructures. There is little risk that scour could cause failure in high flows.

R4 Highly erodible rock with advanced or serious scour that could advance and threaten substructures during high flows. Rock may be highly -weathered, faulted and/or soft.

Alluvium Streambeds

A6 Stable alluvium predominantly larger native cobbles and boulders (not riprap) with small amounts of fine material filling the voids. Deeper holes may exist mid-channel. Only minor scour near substructures.

A5 Stable naturally-armored alluvium composed of cobbles, boulders, gravel with some fine material. No advanced scour over a long time period. Potential for scour exists only under high water velocity. Deeper holes may exist in mid-channel. Near substructures only minor scour may be present.

A4 Alluvium mixture of fine particles with some larger aggregate. Some cobbles and boulders may be present. Potential for scour during ordinary high water. Advanced scour may be present or have occurred.

A3 Highly erodible alluvium predominantly very small particles: clays, silts and/or fine sands. High scour potential at all water velocities. Advanced scour may be present or have occurred in the past.

**IU07 Stream Bed Material Desc - Stream Bed Material Description**

(Old BMS Item W07)

**Description:**

This item provides a description of the streambed material.

**Coding:**

Description of streambed and/or countermeasures in narrative form.

Items IU08 to IU26 are items to store data used in the scour calculator. Refer to the USGS *Software User's Guide for Determining the Pennsylvania Scour Critical Indicator Code and Streambed Scour Assessment Rating for Roadway Bridges and Procedures for Scour Assessments at Bridges in Pennsylvania* for more information.

## IU08 Debris Ptn - Debris Potential

### 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 potential for debris to accumulate at the structure.

If the opening is constricted, a greater potential for debris blockage may be present.

### Coding:

- |            |                                                                                                                                                                                         |
|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 0 - Low    | Waterway opening capable of handling debris or opening reasonably sized and debris can pass smoothly through the structure. For small structures, there are no apparent debris sources. |
| 1 - Medium | Increased risk of debris                                                                                                                                                                |
| 2 - High   | High probability of debris or debris presently blocking or partially blocking a significant portion of the adjoining span (>20% of hydraulic opening).                                  |

## IU09 Trapping Ptn - Trapping Potential

### Description:

This item records the potential for the bridge to trap debris. Trapping potential is affected by factors such as size of bridge opening, sediment deposits, presence and orientation of piers and attack angles.

### Procedure:

Select the code from the dropdown list that indicates the trapping potential for the structure.

### Coding:

- |   |        |
|---|--------|
| 0 | Low    |
| 1 | Medium |
| 2 | High   |

| Single Span Parameters | 0 - Low                  | 1 - Medium                   | 2 - High              |
|------------------------|--------------------------|------------------------------|-----------------------|
| Clear Span             | > 50 ft                  | > 40 ft                      | ≤ 40 ft               |
| Underclearance         | > 15 ft                  | > 10 ft                      | ≤ 10 ft               |
| Opening Adequacy       | Good - Fair *            | Poor *                       | Overtopping*          |
| Sediment Deposits      | None - Minor **          | Medium **                    | High**                |
| Multi-Span Parameters  | 0 - Low                  | 1 - Medium                   | 2 - High              |
| Clear Span             | > 100 ft                 | > 75 ft                      | ≤ 75 ft               |
| Underclearance         | > 15 ft                  | > 10 ft                      | ≤ 10 ft               |
| Opening Adequacy       | Good - Fair*             | Poor*                        | Overtopping*          |
| Sediment Deposits      | None - Minor**           | Medium**                     | High**                |
| Pier Location          | No piers in main channel | Piers may be in main channel | Piers in main channel |

\* Refer to BMS2 item IN08

\*\* Refer to BMS2 item IN09

## IU10 Pressure Flow

**Description:**

This item indicates whether or not the bridge is exhibiting signs of accelerated stream flow. Pressure Flow is defined as the flow that occurs when the stream stage exceeds the clearance of the bridge opening.

**Procedure:**

If the bridge is exhibiting signs of pressure flow, select "Yes". Otherwise, select "No" from the dropdown list.

**Coding:**

- 0      No, The bridge is not exhibiting signs of pressure flow
- 1      Yes, The bridge is exhibiting signs of pressure flow

## IU11 NAB Location - Near Abutment Location

**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

## IU12 FAB Location - Far Abutment Location

**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

## IU13 US Left WW Presence - Upstream Left Wingwall Presence

### 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 or not 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

## IU14 Condition - Condition of Upstream Left Wingwall

### 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.

## IU15 US Right WW Presence - Upstream Right Wingwall Presence

### 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 or not 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

## IU16 Condition - Condition of Upstream Right Wingwall

### 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.

## IU17 Horizontal Debris Start - Horizontal Debris Blockage Start

### 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.

### 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 on page 3-306.

## IU18 Horizontal Debris End - Horizontal Debris Blockage End

### 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.

**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 on page 3-306.

## IU19 Vert Debris Start - Vertical Debris Blockage Start

**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.

**Coding:**

Location where the debris blockage starts in terms of percentage of vertical clearance from the streambed. Use equivalent debris dimensions. See example in Figures-1 and -2 on page 3-306.

## IU20 Vert Debris End - Vertical Debris Blockage End

**Description:**

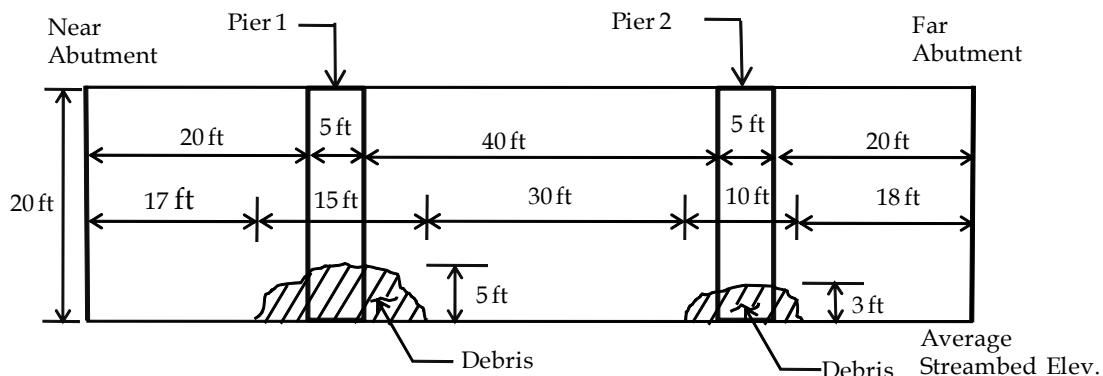
This item indicates the vertical location where the debris blockage ends, if present.

**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.

**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 example in Figures-1 and -2 on page 3-306.

**Figure 1 - Observed Debris**

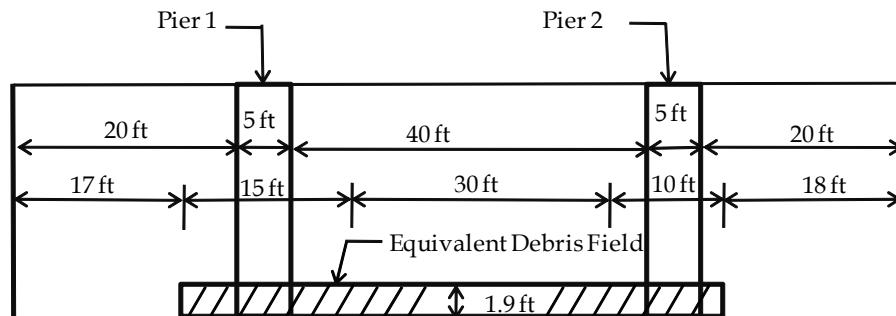
$$\text{Total Opening Length} = 20 \text{ ft} + 5 \text{ ft} + 40 \text{ ft} - 5 \text{ ft} + 20 \text{ ft} = 90 \text{ ft}$$

$$\text{Total Opening Height} = 20 \text{ ft}$$

$$\text{Actual Debris Area} = (5 \text{ ft} \times 15 \text{ ft}) + (3 \text{ ft} \times 10 \text{ ft}) = 105 \text{ ft}^2$$

$$\text{Modified Length of Blockage} = 15 \text{ ft} + 30 \text{ ft} + 10 \text{ ft} = 55 \text{ ft}$$

$$\text{Equivalent Debris Height} = 105 \text{ ft}^2 / 55 \text{ ft} = 1.9 \text{ ft}$$

**Figure 2 - Equivalent Debris**

IU17 Horizontal Debris Blockage Start = 17 ft / 90 ft x 100% = 19%

IU18 Horizontal Debris Blockage End = (17 ft + 55 ft) / 90 ft x 100% = 80%

IU19 Vertical Debris Blockage Start = 0%

IU20 Vertical Debris Blockage End = (1.9 ft / 20 ft) x 100% = 10%

## IU21 Type - Current Scour Countermeasure Type

### Description:

This item indicates the type of scour countermeasure(s) currently in place at the structure, if any.

### Procedure:

Select the type of countermeasure currently in place from the dropdown list.

**Coding:**

- 0 None
- 1 Riprap
- 2 Gabions
- 3 Guidebanks
- 4 Concrete Encasement
- 5 Other

**IU22 Location - Location of Current Scour Countermeasure****Description:**

This item is used to record the location where the current scour countermeasure has been placed.

**Procedure:**

Select the location where the current scour countermeasure has been placed from the dropdown list.

**Coding:**

- 1 Upstream left wingwall (USLWW)
- 2 Upstream right wingwall (USRWW)
- 3 Near Abutment (NAB)
- 4 Pier
- 5 Channel
- 6 Far Abutment (FAB)
- 7 Left Bank (LB)
- 8 Right Bank (RB)
- 9 Downstream left wingwall (DSLWW)
- 10 Downstream right wingwall (DSRWW)

**IU23 Cond - Condition of Current Scour Countermeasure****Description:**

This item indicates the condition of the current scour countermeasure selected in item IU21.

**Procedure:**

Select the appropriate condition code from the dropdown list.

**Coding:**

- 1 Good – The countermeasure is performing as intended.
- 2 Partial – The countermeasure is present but not performing as intended.
- 3 Failed – The countermeasure is no longer present or is completely ineffective.

**IU24 Sub Unit - Subunit Number****Description:**

This item is used to record the subunit number, if applicable, where the current scour countermeasure is located.

**Procedure:**

Select the subunit number, if applicable, where the current scour countermeasure is located. This item is limited to the piers and abutments previously defined for the structure.

**Coding:**

Subunit number where the current scour countermeasure is located.

## IU25 Location of Potential Scour Countermeasure

**Description:**

This item is used to record the location where potential scour countermeasures may need to be placed.

**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

**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:**

|         |                               |
|---------|-------------------------------|
| E744803 | Footing (Underpin)            |
| A745101 | Abut. Slopewall (REP/REPL)    |
| A705301 | Streambed Paving (REP/CONSTR) |
| B745301 | Rock Protection               |
| C745301 | Scour Hole (Backfill)         |
| ECREMVG | Vegetation/Debris (Remove)    |
| ECREMDP | Deposition (Remove)           |
| B745202 | Apron/Cutoff Wall (REP/REPL)  |

## 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     | IN02     | IN03         | IN04<br>Change<br>Since<br>Last Insp | IN05       | IN06         | IN07         | IN08<br>Oper<br>Ad<br>Ch              |
|----------|----------|--------------|--------------------------------------|------------|--------------|--------------|---------------------------------------|
| Sub Unit | Curr Ind | Scour Rating | Last Insp                            | Scour Hole | Debris Potn. | Scourability |                                       |
|          |          |              |                                      |            |              |              | <input type="button" value="Create"/> |
|          |          |              |                                      |            |              |              | <input type="button" value="Remove"/> |

**Sub Unit Detail:**

IN12 Pier/Abut Type: [dropdown] IN13 Inv Found Type: [dropdown]  
 IN14 Found Type: [dropdown] IN15 Streambed Matl: [dropdown]  
 IN16 UW Insp Type: [dropdown] IN17 Ob Scour Depth: [ ] ft IN18 Water Depth: [ ] ft  
 IN19 Movement Ind:  IN20 Scour/Undermine Ind:  IN21 Countermeasures:  IN22 100 yr Flood Sc. Depth: [ ] ft  
 IN23 500 yr Flood Sc. Depth: [ ] ft IN24 Notes: [ ]

### IN01 Sub Unit - Abutment, Pier, Culvert, Wingwalls Referencing (Old BMS Item W09)

#### Description:

This item is used to reference the piers, abutments, culvert inlets and outlets and wingwalls.

#### Procedure:

For piers, the 1<sup>st</sup> 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.

Use abutment and pier codes to locate scour inside of single and multi-cell culverts without floors.

Substructure units must be created in the Inventory - Structure Units screen (screen 5D) in order for them to appear in the dropdown list.

**Coding:**

|           |                      |     |                     |
|-----------|----------------------|-----|---------------------|
| NAB       | Near abutment        | WFL | Wingwall, far left  |
| FAB       | Far abutment         | WFR | Wingwall, far right |
| P001-P999 | Number of pier       | CIN | Culvert inlet       |
| WNL       | Wingwall, near left  | COU | Culvert outlet      |
| WNR       | Wingwall, near right |     |                     |

**IN02 Curr Ind - Previous/Current Inspection**

(Old BMS Item W13)

**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.

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**

(Old BMS Item W11-A)

**Description:**

This item is provided for the inspector's on-site evaluation of the substructure's risk from scour at each substructure unit.

**Procedure:**

Select the code from the dropdown list that indicates current status of the unit regarding its vulnerability 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 the actual scour and resultant damage to the bridge.

**Coding:**

For ratings 2, 1 and 0, codings are the same as for 4A08. For ratings 3 through 9, refer to the table below.

**Notes:**

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 quality of conditions at the site.

| 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*   | High             | R4*/A4*                   | Poor*                     | High              | Poor*+    | High                   |
| 3    | High*                                                     | Serious*   | Present*         | 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 for left to right.

\* If an item is so marked, it cannot be given a higher rating.

+ A higher rating may be given if the unit is founded on competent rock and no problems exist.

## IN04 Change Since Last Insp - Change Since Last Inspection (SC)

**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.

**Coding:**

When no change has occurred or change is negative:

None      No change through visual inspection or probing

Minor      No significant changes

Medium      Some changes are apparent, but pose no threat to the structure

High      Significant changes which could affect the structure

In the event that improvements have been made to the site, use the following codes:

9      Improvements or repairs have resolved all scour problems.

8-5      Improvements which solve some, but not all of the scour problems. For example, backfilling scour holes without correcting the cause of the scour (i.e., sedimentation or debris redirecting the flow of the stream).

≤4      Repairs which appear to be inadequate to solve the scour problem(s).

≤3      Newly placed repairs which have failed or worsened conditions.

Repairs include items such as armoring the channel banks, debris removal or refilling scour holes with riprap or concrete. Repairs should be identified in the inspection findings (IN24).

## IN05 Scour Hole (SC)

### 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 structure. Holes refilled with sediment dissimilar to the natural bed material should be considered as scour (see item IN15).

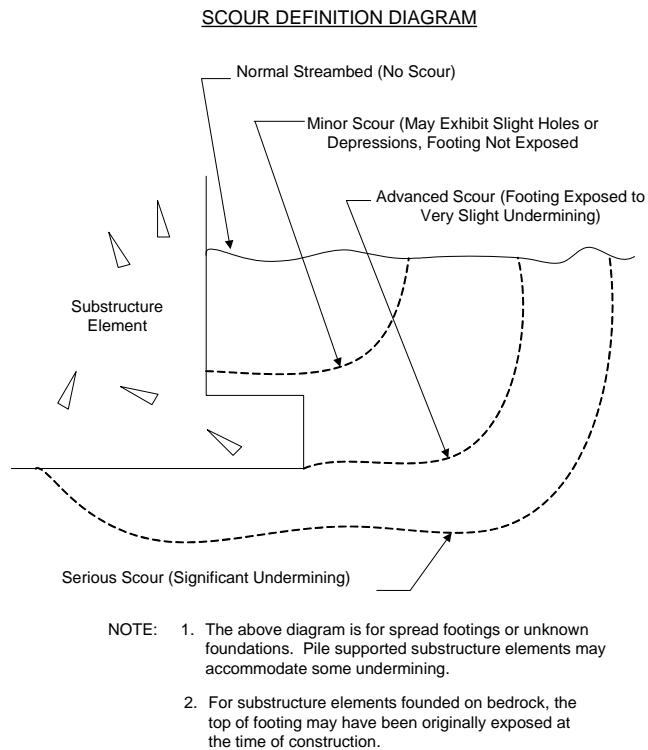
### Coding:

|          |                                                                                                          |
|----------|----------------------------------------------------------------------------------------------------------|
| 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 details. 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 bents where a change in the stable bed elevation is noted should be reviewed with the design computations to determine safe depth of exposure.



## IN06 Debris Potn. - Debris Potential

### 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.

**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

**Present:** Debris presently blocking or partially blocking a significant portion of the adjoining span\*.  
(>20% of hydraulic opening)

\*Note: identify item on maintenance needs sheet.

## IN07 Scourability - Substructure Scourability

**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.

**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 or S.
- Cx**      Countermeasures at a substructure unit can include streambed paving (Cx as defined in IU06) or gabion blankets, grout bags riprap, 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.
- Rx**      Rock – Footing (or concrete sub-footing) bears on Rock type x (see IU06 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, J, K, O or R.
- Ax**      Alluvium – Footing bears on alluvium type x (see IU06 definition). Applicable foundation types IN13=L or O. If foundation type unknown, (IN13 = P or X), use conservative value for Ax.

Corresponding number value for "x":

If the substructure is founded on competent bedrock, piles, or adequate countermeasures 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 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, the inspection frequency of the structure, 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 IU06, for a more thorough description of A6, A5, A4 and A3).

## IN08 Opening Adequacy/Channel

### 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.

### 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 Deposits

### Description:

This item describes the accumulation of fine material blocking or partially blocking the structure.

### Procedure:

Select the code from the dropdown list that the accumulation of fine material blocking or partially blocking the structure.

### 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.              |

\*Note: identify item on maintenance needs sheet.

## IN10 Alignment

### 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.

### 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

### 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.

### 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 OSA Pier/Abut Type - OSA Pier / Abutment Type (SC)

### 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.

### Coding:

| Abutments:                            | Piers:           |
|---------------------------------------|------------------|
| 1 Stub                                | 21 Timber        |
| 2 Cantilever                          | 22 Steel         |
| 3 Gravity Concrete                    | 23 Concrete      |
| 4 Spill-through                       | 24 Stone Masonry |
| 5 Unknown Concrete                    | 25 Other         |
| 6 Stone Masonry                       |                  |
| 7 Piles / Bents                       |                  |
| 8 Concrete without piles / bents      |                  |
| 9 Mechanically Stabilized Earth (MSE) |                  |
| 10 Other                              |                  |

## IN13 PA Found Type - PA Foundation Type (SC)

(Old BMS Item W10)

### Description:

This item indicates the foundation type at specific site(s).

**Procedure:**

Select the code from the dropdown list that represents the foundation type at the specific pier, abutment, culvert and/or wingwall site(s) referenced in item IN01.

**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 | Spread footing on competent* bedrock (see codes K and R) | K | Spread footings or culverts with an integral bottom on erodible bedrock (such as claystone, clay shales, some silt stone, shales and weathered bedrock) |
| B | Cast-in-place concrete piles                             | L | Spread footings or culverts with an integral bottom on soils (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 is 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 OSA Found Type - OSA Foundation Type (SC)****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 based on the value input for IN13.

**Coding:**

| <u>IN14 Material</u> | <u>IN13 Coding</u>           |
|----------------------|------------------------------|
| 1- Bedrock           | A, R                         |
| 2- Alluvium          | K, L                         |
| 3- Piles/Caissons    | B, C, D, E, F, G, H, I, J, S |
| 4- Other             | O                            |
| 5- Not Observed      | P, X                         |
| Blank                |                              |

## IN15 Streambed Matl - Stream Bed Material (SC)

(Old BMS Item W07)

### Description:

This item correlates the stream bed material (native or paved) with its potential for general scour for a particular substructure unit.

### Procedure:

Select the code from the field dropdown list that correlates to the stream bed material (native or paved) with its potential for general scour for a particular substructure unit.

### Coding:

#### Countermeasures-Paved Streambeds:

- C8 Streambed paved with concrete gabions or grout bags in good condition and adequate to resist scour.
- C7 Streambed paved with concrete gabions, grout bags or placed rock in good condition. Minor problems may exist. Scour protection is adequate.

#### Bedrock Streambeds (not riprap):

- R9 Non-erodible rock. Minor faulting or weathering may be present. Deeper holes may exist in mid-channel. Only minor scour near substructures.
- R8 Erodible rock. Rock may be faulted, weathered and/or soft. Deeper holes may exist in mid-channel. Near substructures only minor scour may be present.
- R7 Erodible rock. More advanced weathering and/or faulting may be present. Minor or advanced scour is present and may be adjacent to substructures. There is little risk that scour could cause failure in high flows.
- R4 Highly erodible rock with advanced or serious scour that could advance and threaten substructures during high flows. Rock may be highly weathered, faulted and/or soft.

#### Alluvium Streambeds

- A6 Stable alluvium predominantly larger native cobbles and boulders (not riprap) with small amounts of fine material filling the voids. Deeper holes may exist mid-channel. Only minor scour near substructures.
- A5 Stable naturally-armored alluvium composed of cobbles, boulders, gravel with some fine material. No advanced scour over a long time period. Potential for scour exists only under high water velocity. Deeper holes may exist in mid-channel. Near substructures only minor scour may be present.
- A4 Alluvium mixture of fine particles with some larger aggregate. Some cobbles and boulders may be present. Potential for scour during ordinary high water. Advanced scour may be present or have occurred.
- A3 Highly erodible alluvium predominantly very small particles: clays, silts and/or fine sands. High scour potential at all water velocities. Advanced scour may be present or have occurred in the past.
- 01-81 These values are old values and should not be used.

## IN16 UN Insp Type - Underwater Inspection Type

(Old BMS Item W11-B)

### Description:

This item is used to record the underwater inspection performed.

**Procedure:**

Select the appropriate code from the dropdown list.

**Coding:**

- A Underwater inspection performed by divers
- B Probing performed by divers
- C Inspection not completed. Underwater inspection by divers is required.
- D Inspection not completed. Return to site during low water for normal inspection.
- E No underwater inspection required. Normal inspection performed (may include probing).
- S Partial inspection for USGS scour evaluation.

**IN17 Ob Scour Depth - Observed Scour Depth**

(Old BMS Item W11-C)

**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.

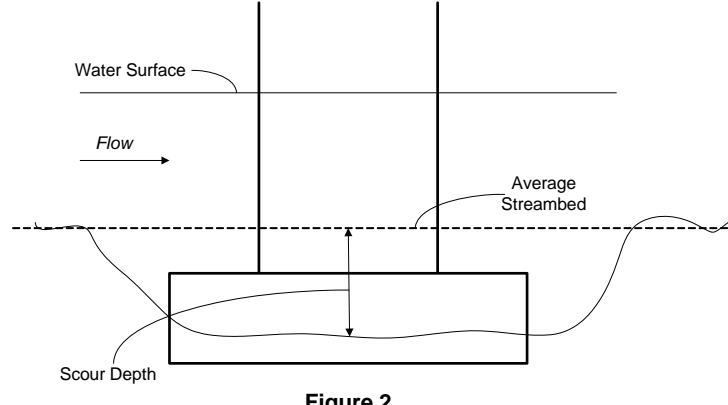
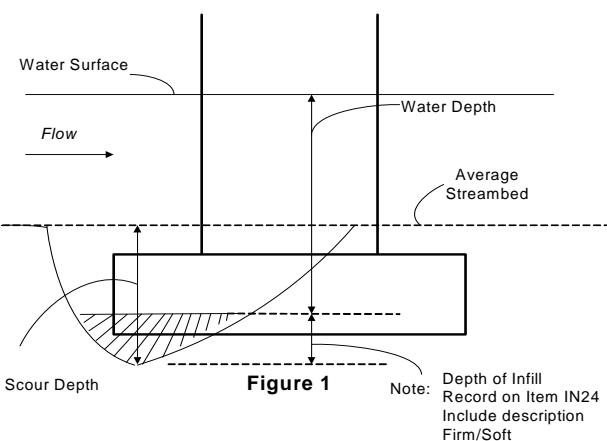
**Procedure:**

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 in feet and tenths of feet

**Example:**

The observed scour depth is 6' 4":

6.3

**IN18 Water Depth**

(Old BMS Item W11)

**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 foot.

**Coding:**

Maximum water depth to the nearest foot. Code "1" if any water present.

**IN19 Movement Ind - Movement Indicator (SC)****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.

**Coding:**

|           |                                                 |
|-----------|-------------------------------------------------|
| Unchecked | There has not been any movement at the sub unit |
| Checked   | There has been movement at the sub unit         |

**IN20 Scour / Undermining Ind - Scour / Undermining Indicator****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.

**Coding:**

|           |                      |
|-----------|----------------------|
| Unchecked | Scour is not present |
| Checked   | Scour is present     |

## IN21 Countermeasures

(Old BMS Item W11-F)

### Description:

This checkbox field that indicates if scour countermeasures are in place at a specific pier, abutment, culvert, and/or wingwall location.

### Procedure:

Check the box to indicate that countermeasures are in place at specific pier, abutment, culvert and/or wingwall sites. Otherwise, leave the box unchecked.

### Coding:

- |           |                                                              |
|-----------|--------------------------------------------------------------|
| Unchecked | No countermeasures exist, or no countermeasures are required |
| Checked   | Countermeasures are in place                                 |

### Note:

Unless countermeasures are verified to counter scour, leave this item unchecked. Countermeasures that are stable and in place are considered to have countered scour.

## IN22 100 yr Flood Sc. Depth - Calculated Scour Depth w/100 Year Flood

(Old BMS Items W11-D and D12-B)

### 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 in feet and tenths of feet

#### Examples:

The 100 year calculated scour depth is 6'4": 

|     |
|-----|
| 6.3 |
|-----|

The 100 year calculated scour depth is 2'6": 

|     |
|-----|
| 2.5 |
|-----|

## IN23 500 yr Flood Sc. Depth - Calculated Scour Depth w/500 Year Flood

(Old BMS Items W11-E and D12-B)

### 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 in feet and tenths of feet.

**IN24 Notes - Inspection Notes**

(Old BMS Item W12)

**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.

**Coding:**

A narrative description of inspection findings.

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## IL Inspection - Underwater - Other

The Inspection - Underwater Scour - Other screen is used to view and edit waterway adequacy and underclearance information about a structure.

**PennDOT BMS2 Inspection Applet**

**Bridge:** 04003001901102    **Inspections (12):** 04/15/2009     Metric     English    [?](#) [Print](#) [Back](#) [Forward](#) [Help](#) [Save](#)

**Safety Features | Load Rating | FracCrit | Underwater | Signing | Comments |**

|                                                                     |                                                 |                                      |
|---------------------------------------------------------------------|-------------------------------------------------|--------------------------------------|
| 7A03 Primary Insp Type: R - Regular (routine)                       | IU00a UW Reviewer Action:                       | 4A08 SCBI: 8 - Stable Above Footin   |
| 7A09 Inspection Freq: 24 Months                                     | IU01 Recalculate SCBI: <input type="checkbox"/> | IU02 Num Units: <input type="text"/> |
| IU00b Review<br>Comments:<br><br><input type="button" value="New"/> |                                                 |                                      |

**SCBI | Sub Units | Other**

**Structure Level Data**

|                                             |                                      |
|---------------------------------------------|--------------------------------------|
| 1A08 Water Adequacy: 6                      | IL01 Notes: <input type="text"/>     |
| IL02 Risk of Overtopping: 3 - Slight        | IL03 Traffic Delay: I - Insignifical |
| IL04 Func Class: 06 - Rural Minor           |                                      |
| <b>High Water Mark</b>                      |                                      |
| IL05 Elevation: -1 ft                       | IL06 Date: 01/01/1901                |
| IL07 New High Water: 0 - Not a new mark     |                                      |
| IL08 High Water Notes: <input type="text"/> |                                      |

**Underclearance**

### IL01 Water Adequacy - Waterway Adequacy Notes

#### Description:

This item is used to record notes about the waterway adequacy.

#### Procedure:

Enter any notes about the waterway adequacy in narrative form.

#### Coding:

Notes about the waterway adequacy in narrative form.

## **IL02 Risk of Overtopping**

(Old BMS Item \*E27)

### **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**

(Old BMS Item E27)

### **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**

(Old BMS Item B18)

### **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

### 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

### 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

### 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

**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

**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 lowered 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

**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

### 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

### 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.

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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 accessed by clicking on the applet button on the Inspection Desktop. At the top of the screen is the select Inspection field.

The screenshot shows the 'PennDOT BMS2 Inspection Applet' window. The 'Signing Details' tab is active. At the top, there are fields for 'Bridge:' and 'Inspection:', unit selection buttons for 'Metric' and 'English', and standard window control buttons. Below these are tabs for 'Safety Features', 'Load Rating', 'FracCrit', 'Underwater', 'Signing Details' (selected), and 'Comments'. The 'Signing Details' section contains two dropdown menus labeled 'ID01 Type of Sign' and 'ID02 Sign Needed?'. To the right of these are 'Create' and 'Remove' buttons. Below this are several input fields: 'ID03 Sign Message:' (text box), 'ID04 Near Advance:' and 'ID05 Far Advance:' (dropdown menus), 'ID06 Bridge Site Near:' and 'ID07 Bridge Site Far:' (dropdown menus), and 'ID08 Notes:' (text area with a small image icon). A 'Save' button is located at the top right of the main window area.

### ID01 Type of Sign

#### Description:

This item indicates the sign type.

#### Procedure:

Select the type of sign from the dropdown list.

#### Coding:

- |   |                            |   |                  |
|---|----------------------------|---|------------------|
| 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            |
| 5 | Vertical Clearance - Under |   |                  |

## ID02 Sign Needed?

**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

**Description:**

This item is used to record the sign message.

**Procedure:**

Enter the sign message in narrative form.

## ID04 Near Advance

**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

**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****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****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****Description:**

This item is used to record notes about the signing at the structure.

**Procedure:**

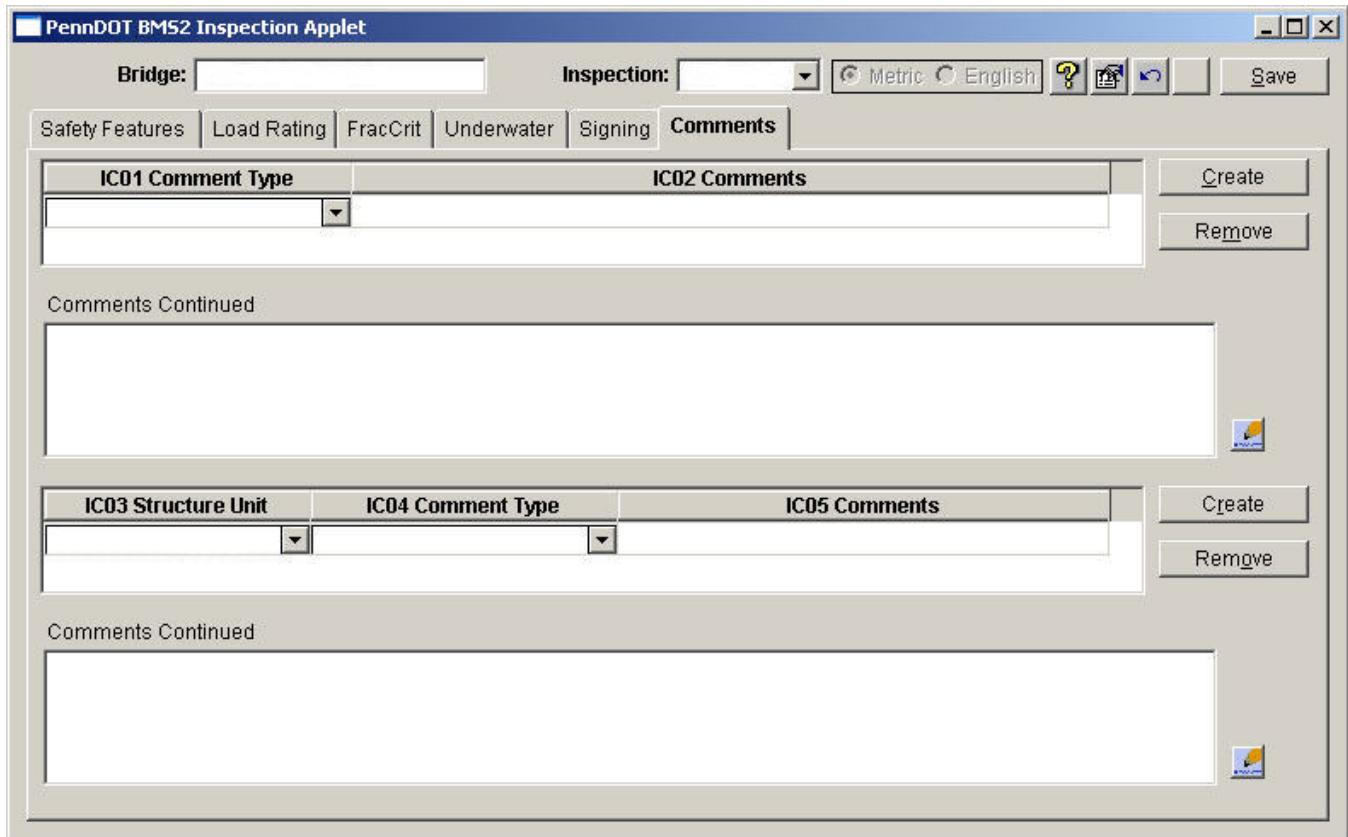
Enter comments about the signing at the structure in narrative form.

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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 iForm screens.

The screen is accessed by clicking on the applet button on the Inspection Desktop. 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

#### Description:

This item indicates the type of inspection comment for the structure.

#### Procedure:

Select the type of inspection comment from the dropdown list.

**Coding:**

| <b>Description</b>                      | <b>Description</b>                              |
|-----------------------------------------|-------------------------------------------------|
| 1 Approach Alignment                    | 47 Streambed Movements                          |
| 2 Approach Roadway / Pavement           | 48 Debris, Vegetation                           |
| 3 Approach Roadway / Drainage           | 49 River (Stream) Control Devices               |
| 4 Approach Roadway / Shoulders          | 50 Embankment / Streambed Controls              |
| 5 Approach Slab                         | 51 Drift, Other                                 |
| 6 Relief Joint                          | 52 High Water Mark                              |
| 7 Safety Features / Bridge Railing      | 53 Paint / Interior Beam / Girder               |
| 8 Safety Features / Transition          | 54 Paint / Fascias                              |
| 9 Safety Features / Approach Guiderrail | 55 Paint / Splash Zone: Truss / Girder          |
| 10 Safety Features / Approach Rail Ends | 56 Paint / Truss                                |
| 11 Deck Geometry                        | 57 Paint / Bearings                             |
| 12 Deck                                 | 58 Paint / Other                                |
| 13 Deck Drainage                        | 59 Culvert / Top Slab                           |
| 14 Deck Wearing Surface                 | 60 Culvert / Barrel                             |
| 15 Superstructure                       | 61 Culvert / Floor / Paving                     |
| 16 Superstructure / Diaphragms          | 62 Culvert / Headwall                           |
| 17 Superstructure / Portals & Bracing   | 63 Culvert / Wings                              |
| 18 Superstructure / Drainage            | 64 Culvert / Settlement                         |
| 19 Substructure                         | 65 Culvert / Debris                             |
| 30 Super / Girders                      | 66 Waterway Adequacy                            |
| 31 Super / Floorbeams                   | 67 Recalculate IR/OR Due to:                    |
| 32 Super / Stringers                    | 68 Approach Roadway                             |
| 33 Super / Truss Mem                    | 69 Bump at Bridge                               |
| 34 Super / Bearings                     | 70 Deck / Expansion Joint                       |
| 35 Deck Top                             | 71 Culvert                                      |
| 36 Deck Underside                       | 72 Controlling Lateral (for Item 4A11)          |
| 45 Channel                              | 73 Actual Special Inspection Equipment required |
| 46 Banks                                | 220 Inventory Data Review                       |

**IC02 Comments - Inspection 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****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

### 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
- 21 Abutment / Bridge Seats
- 22 Abutment / Cheekwalls
- 23 Abutment / Stem
- 24 Abutment / Wings
- 25 Abutment / Footing
- 26 Abutment / Piles
- 27 Abutment / Settlement
- 28 Abutment / Embankment Slopewall
- 29 Abutment / Wall Drainage
- 40 Pier
- 41 Pier / Bridge Seats
- 42 Pier / Cheekwalls
- 43 Pier / Columns/Stems
- 44 Pier / Settlement

## IC05 Comments - Structure Unit 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] work tab. This tab supports a new function in BMS2 that 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] work tab.

BMS2 Procedure for creating Bridge work notifications in SAP:

1. Navigate to the Maintenance Applet 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 IM9) 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 tab. 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 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.

**PennDOT BMS2 Maintenance Applet**

Bridge: 01001500700986 Metric English Save

**Proposed | Completed |**

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

| #     | IM02 Element               | IM03 Action         | IM05 Priority | IM06 Date Recom      | IM07 Status |
|-------|----------------------------|---------------------|---------------|----------------------|-------------|
| 1 n/a |                            | (blank)             |               |                      |             |
| 2 n/a | 11-C745301-BKFL SCOUR HOLE | 3 - Add to Schedule | 02/17/1993    | 0 - Work not planned |             |

**Create** **Remove** **Submit to SAP**

IM01 Scope: Element IM08 Target Year:   
 IM02 Element: All Units / Type:  IM09 Location:   
 IM03 Action:  IM10 Est Cost:   
 IM04 Est Quantity:  IM11 Work Assign: (blank)   
 IM05 Priority: (blank) IM12 Drawing Ind:  IM13 Permit Ind:   
 IM06 Date Recom:  IM14a Comp Date:   
 IM07 Status: (blank) IM14b POA Date:   
 IM15a Notes:    
 IM15b Deferred Reason:    
 IM15c Bridge Appr:   
 IM15d Maint Appr:

**PennDOT BMS2 Maintenance Applet**

Bridge: 01001500700986 Metric English Save

**Proposed | Review Completed Work |**

| IM01 Scope | IM02 Element | IM03 Action              | IM05 Priority | IM07 Status        | IM14 Comp Date |
|------------|--------------|--------------------------|---------------|--------------------|----------------|
| Flexaction | n/a          | 11-C745301-BKFL SCOUR HC | 2 - Priority  | 5 - Completed/Dept |                |

IM01 Scope: Flexaction IM14 Comp Date:   
 IM02 Element: n/a IM16 SAP Closed Date:   
 IM03 Action: 11-C745301-BKFL SCOUR HOLE IM17 SAP WO Num:   
 IM05 Priority: 2 - Priority IM18 Act Quan:  ea.  
 IM07 Status: 5 - Completed/Dept IM19 Act Cost:   
 IM21 Notes:  IM20 MPMS#:

## IM01 Scope

### 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****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 Pub. 590 "PA CoRe Element Coding Guide" for complete element descriptions.

**IM03 Action**

(Old BMS Item H01, H02, H04)

**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                  |

When IM01, Scope is "Element", refer to Pub. 590 for available "Feasible Actions."

When IM01, Scope is "Flex Action", the following actions are available to choose from:

| Description of Activity            | Identifier<br>(IM03) | Unit | Category* | Description of Activity          | Identifier<br>(IM03) | Unit | Category* |
|------------------------------------|----------------------|------|-----------|----------------------------------|----------------------|------|-----------|
| <b>APPROACH ROADWAY</b>            |                      |      |           |                                  |                      |      |           |
| Pavement (Patch/Raise)             | 40-RDPAVMT           | SY   | Other     | TRUSS                            |                      |      |           |
| Pavement Relief Jt. (Rep/Repl)     | 41-RDRLFJT           | SY   | Other     | Members (Strengthen/Rep/Repl)(2) | 36-A744701           | EA   | Bridge    |
| Shoulders (Repair/Reconstr)        | 46-RDSHLDR           | SY   | Other     | Portal (Modify)                  | 82-B744701           | EA   | Bridge    |
| Drainage-Off Bridge (Improve)      | 47-RDDRAIN           | EA   | Other     | Members (Tighten/Flame shorten)  | 71-C744702           | EA   | Bridge    |
| Guide Rail (Connect to Bridge)     | 27-RDGDERL           | EA   | Other     | <b>PAINTING</b>                  |                      |      |           |
| Load Limit Signs (Replace)         | 70-RDLDSGN           | EA   | Other     | Superstructure - Spot            | 57-A743201           | EB   | Bridge    |
| Clearance Signs (Replace)          | 51-RDCLSGN           | EA   | Other     | Substructure - Spot              | 16-B743201           | EB   | Bridge    |
| Cut Brush to Clear Signs           | 24-RDBRUSH           | EA   | Other     | Superstructure - Full            | 65-C743201           | EB   | Bridge    |
| Approach Slab (Replace)            | 64-A744201           | SY   | Other     | Substructure - Full              | 79-D743201           | EB   | Bridge    |
| <b>CLEAN/FLUSH</b>                 |                      |      |           |                                  |                      |      |           |
| Deck                               | 23-A743101           | EB   | Cleaning  | ABUTMENT - WING - PIER, etc.     |                      |      |           |
| Scupper/Down spouting              | 1-B743101            | EB   | Cleaning  | Back wall (Rep/Repl)             | 38-A744801           | CY   | Bridge    |
| Bearing/Bearing Seat               | 8-C743102            | EB   | Cleaning  | Abutments (Repair)               | 28-B744802           | CY   | Bridge    |
| Steel-Horizontal Surfaces          | 34-D743102           | EB   | Cleaning  | Wing (Rep/Repl)                  | 15-C744802           | CY   | Bridge    |
| <b>DECK</b>                        |                      |      |           |                                  |                      |      |           |
| Batum. Deck W. Surf (Rep/Repl)     | 10-BITWRGS           | SY   | Bridge    | Piers (Repair)                   | 32-D744802           | CY   | Bridge    |
| Timber Deck (Rep/Repl)             | 35-B744301           | SY   | Bridge    | Footing (Underpin)               | 22-E744803           | CY   | Bridge    |
| Open Steel Grid (Rep/Repl)         | 37-C744302           | SY   | Bridge    | Masonry (Repoint)                | 19-F744804           | LF   | Bridge    |
| Concrete Deck (Repair)             | 6-D744303            | SY   | Bridge    | Abut. Slopewall (Rep/Repl)       | 56-A745101           | SY   | Other     |
| Concrete Sidewalk (Repair)         | 39-E744303           | SY   | Bridge    | Abut. Slopewall (Construct New)  | 43-B745102           | CY   | Other     |
| Concrete Curb/Parapet (Rep)        | 21-F744303           | SY   | Other     | Pile Repair                      | 67-A745901           | EA   | Bridge    |
| <b>DECK JOINTS</b>                 |                      |      |           |                                  |                      |      |           |
| Reseal                             | 2-A743301            | LF   | Bridge    | <b>SCOUR CONTROL</b>             |                      |      |           |
| Repair/Reseal                      | 4-A744101            | LF   | Bridge    | Stream Bed Paving (Rep/Constr)   | 30-A745301           | CY   | Bridge    |
| Compression Seal (Rep/Rehab)       | 33-B744102           | LF   | Bridge    | Rock Protection                  | 13-B745301           | CY   | Bridge    |
| Modular Dam (Rep/Rehab)            | 53-C744102           | LF   | Bridge    | Scour Hole (Backfill)            | 11-C745301           | CY   | Bridge    |
| Steel Dams (Rep/Rehab)             | 20-D744102           | LF   | Bridge    | Stream Deflector (Rep/Constr)    | 55-D745302           | CY   | Bridge    |
| Other Types (Rep/Rehab)            | 9-E744102            | LF   | Bridge    | Vegetation/Debris (Remove)       | 3-ECREMVG            | CY   | Bridge    |
| <b>RAILING</b>                     |                      |      |           |                                  |                      |      |           |
| Bridge/Parapet (Rep/Repl)          | 7-RLGBRPR            | LF   | Bridge    | Deposition (Remove)              | 12-ECREMMP           | CY   | Bridge    |
| Struct Mount (Rep/Repl)            | 17-RLGSTRM           | LF   | Bridge    | <b>CULVERT</b>                   |                      |      |           |
| Pedestrian (Rep/Repl)              | 18-RLGPEDN           | LF   | Bridge    | Headwall/Wings (Rep/Repl)        | 29-A745201           | SY   | Bridge    |
| Median Barrier (Rep/Repl)          | 58-RLGMEDB           | LF   | Other     | Apron/Cutoff Wall (Rep/Repl)     | 63-B745202           | SY   | Bridge    |
| <b>DECK DRAIN</b>                  |                      |      |           |                                  |                      |      |           |
| Scupper Grate (Replace)            | 52-DRNGRAT           | EA   | Bridge    | Barrel (Repair)                  | 48-C745203           | SY   | Bridge    |
| Drain/Scupper (Install)            | 31-B744401           | EA   | Bridge    | <b>SIGN STRUCTURES</b>           |                      |      |           |
| Down spouting (Rep/Repl)           | 14-C744402           | EA   | Bridge    | Sign Struct (Rep/Repl)           | 75-SSSTRU            | EA   | Other     |
| <b>BEARINGS</b>                    |                      |      |           |                                  |                      |      |           |
| Lubricate                          | 66-A743501           | EA   | Other     | Sign Attach (Rep/Repl)           | 74-SSATTAC           | EA   | Other     |
| Steel (Rep/Rehab)                  | 44-A744501           | EA   | Other     | Sign Str Surface Spot            | 86-SSSURVS           | SF   | Other     |
| Steel (Replace)                    | 61-B744501           | EA   | Bridge    | Lighting Sys (Rep/Repl)          | 73-SSLIGHT           | EA   | Other     |
| Expansion (Reset)                  | 68-C744502           | EA   | Bridge    | Sign Access (Rep/Repl)           | 87-SSACCES           | EA   | Other     |
| Pedestal/Seat (Reconstruct)        | 45-D744503           | EA   | Bridge    | Struct Connection (Repl)         | 78-SSCONNT           | EA   | Other     |
| <b>TIMBER</b>                      |                      |      |           |                                  |                      |      |           |
| Stringer (Rep/Repl)                | 62-A744601           | EA   | Bridge    | <b>RETAINING WALLS</b>           |                      |      |           |
| Other Members (Rep/Repl)           | 60-B744601           | EA   | Bridge    | Retaining Wall (Rep/Repl)        | 77-RTWALLR           | LF   | Other     |
| <b>STEEL</b>                       |                      |      |           |                                  |                      |      |           |
| Stringer (Rep/Repl)                | 25-A744602           | EA   | Bridge    | Facing (Rep/Repl)                | 83-RTFACNG           | SY   | Other     |
| Floorbeam (Rep/Repl)               | 50-B744602           | EA   | Bridge    | Regrading                        | 88-RTGRADE           | CY   | Other     |
| Girder (Repair)                    | 49-C744602           | EA   | Bridge    | Drainage (Rep/Repl)              | 85-RTDRAIN           | EA   | Other     |
| Diaph/Lat. Bracing (Rep/Repl)      | 54-D744602           | EA   | Bridge    | Tie Back Connections (Rep/Repl)  | 84-RTTIEBK           | EA   | Other     |
| <b>REINF CONC/PRESTRESSED CONC</b> |                      |      |           |                                  |                      |      |           |
| Stringer (Rep/Repl)                | 42-A744603           | EA   | Bridge    | <b>APPLY PROTECTIVE COATING</b>  |                      |      |           |
| Diaphragm (Rep/Repl)               | 69-B744603           | EA   | Bridge    | Deck/Parapets/Sidewalk           | 80-A743401           | SY   | Other     |
| Other Members (Rep/Repl)           | 26-C744603           | EA   | Bridge    | Substructure                     | 5-B743401            | SY   | Other     |

\* Bridge = Bridge Maintenance

Cleaning = Bridge Cleaning

Other = Other Structural Actions

## **IM04 Est Quantity - Estimated Quantity**

(Old BMS Item H05)

### **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**

(Old BMS Item H08)

### **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:**

|                        | <b>Short Definition</b>                          | <b>Action Timeframe</b>      |
|------------------------|--------------------------------------------------|------------------------------|
| 0 <b>CRITICAL</b>      | Immediate response required .....                | (within 7 days)              |
| 1 <b>HIGH PRIORITY</b> | As soon as work can be scheduled .....           | (within 6 months)            |
| 2 <b>PRIORITY</b>      | Review work plan, adjust schedule if needed..... | (re-prioritize schedule)     |
| 3 <b>SCHEDULE</b>      | Add to scheduled work.....                       | (Add to schedule)            |
| 4 <b>PROGRAM</b>       | Add to programmed work .....                     | (when funds are available)   |
| 5 <b>ROUTINE</b>       | 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 1 and 0.
- 2) All Flexactions must be recorded and input into BMS2 regardless of assigned Priority code.
- 3) 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.

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)<br>53-C744102 - Modular Dam (Rep/Rehab)<br>20-D744102 - Steel Dams (Rep/Rehab)<br>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:

- Broken scupper grates where sufficient separation exists between bars to trap bicycle tires or cause loss of control
- Spalls in concrete decks extending below the top mat of reinforcement
- Holes in corrugated steel flooring for bituminous-filled pan deck

Applicable Flexactions include:

|       |                                                                                                                      |
|-------|----------------------------------------------------------------------------------------------------------------------|
| DECK: | 35-B744301 - Timber Deck (Rep/Repl)<br>6-D744303 - Concrete Deck (Repair)<br>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:

- 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.
- 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.
- 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.
- 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) |
|--------|--------------------------------|

**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 several 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 and/or demonstrates the onset of web crippling.

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 has 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)

16. **Deteriorated Non-Composite Adjacent Box Beam:** Serious deterioration where Item 1A04, Superstructure Condition Rating, is  $\leq 3$  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)

### Substructure Examples

18. **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)

19. **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)

20. **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)

21. **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:

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."

22. **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

23. **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-SSCONNNT - Struct Connection (Repl)

24. **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 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)

25. **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-SSFFOUND - Foundation (Rep/Repl)

26. **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 Flexaction includes :

SIGN STRUCTURES: 73-SSLIGHT - Lighting Sys (Rep/Repl)

### Retaining Wall Examples

27. **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

28. **Serious Scour:** Advanced scour with significant undermining of substructure foundation as defined in the Scour Definition Diagram for Scour Hole (Item IN05 page 3-312):

- Where undermining affects over 20% of the length of the footing 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)

29. **Excessive Debris or Sediment Buildup:** For Scour Critical bridges or those with unknown foundations where debris or sediment buildup is impacting the hydraulic opening defined by the ordinary high water elevation such that:

- > 25% of any individual span opening is blocked, or
- > 25% of the total hydraulic opening is blocked; or
- Serious local scour has occurred adjacent to a substructure unit

Applicable Flexactions include:

SCOUR CONTROL: 3-ECREMVG - 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) |

##### **Superstructure Examples**

4. **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)

5. **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)

#### 6. 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 or sign structure 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)

#### 7. Non -Composite Adjacent Box Beam:

- a. **Cracking:** Deterioration where the superstructure condition rating (Item 1A04) is  $\leq 3$  due to diagonal cracks in a fascia beam located under an open parapet joint.
  - o 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  $\leq 3$  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)

8. **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 Examples

9. **Out of Tolerance Distortion of Flexible Metal Culverts:** Extreme shape deflection and distortion throughout the culvert length. Refer to the FHWA Bridge Inspector's Reference Manual, Session 12.4 Flexible Culverts for precise distortion limits based on design shape.

Applicable Flexactions include:

CULVERT:

48-C745203 - Barrel (Repair)

### Substructure Examples

10. **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).

- o "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)

11. **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)

12. **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)

13. **Abnormal Rocker Bearing Tilt:** Applicable where there is at least one line of expansion rocker bearings and one or more bearing 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)  
Include IM15 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."

14. **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  
Include IM15 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

15. **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.

SIGN STRUCTURES: 75-SSSTRUC - Sign Struct (Rep/Repl)

16. **Serious Steel Member Corrosion:** Multi-beam bridge or 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)

17. **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 Flexaction includes :

SIGN STRUCTURES: 73-SSLIGHT - Lighting Sys (Rep/Repl)

18. **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-SSFFOUND - Foundation (Rep/Repl)

### **Retaining Wall Examples**

19. **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**

20. **Damaging Scour:** Advanced scour with undermining of substructure foundation as defined in the Scour Definition Diagram for Scour Hole (Item IN05 page 3-312):

- Where undermining affects ≤20% of the length of the footing or
- ≤20% of the area under the footing for footings without piles
- This applies to foundations with or without piles.

Applicable Flexactions include:

SCOUR CONTROL: 11-C745301 - Scour Hole (Backfill)

13-B745301 - Rock Protection

ABUTMENT - WING -

PIER, etc.: 22-E744803 - Footing (Underpin)

21. **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 Scour Critical bridges or those with unknown foundations:

- 10% to 25% of any individual span opening is blocked, or
- 10% to 25% of the total hydraulic opening is blocked, or
- Advanced local scour has occurred adjacent to a substructure unit.

- b. For non-Scour Critical bridges 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-ECREMVG - Vegetation/Debris (Remove)

12-ECREMDP - Deposition (Remove)

The use of Priority 0 or 1 is not expected to be justifiable for the following items:

| <b><u>Component</u></b> | <b><u>Maintenance Activity</u></b> |
|-------------------------|------------------------------------|
| 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 dependant 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 3-359
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 3-360.

#### **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)<br>50-B744602 - Floorbeam (Rep/Repl)<br>49-C744602 - Girder (Repair)               |
| SIGN STRUCTURES: | 75-SSSTRU - Sign Struct (Rep/Repl)<br>74-SSATTAC - Sign Attach (Rep/Repl)<br>78-SSCONNNT - 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)<br>28-B744802 - Abutments (Repair)<br>15-C744802 - Wing (Rep/Repl)<br>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. **Out of Tolerance Distortion of Flexible Metal Culverts:** Extreme shape deflection and distortion in at least one section with varying levels of lesser shape deviation throughout.

Applicable Flexactions include:

|          |                              |
|----------|------------------------------|
| CULVERT: | 48-C745301 - Barrel (Repair) |
|----------|------------------------------|

5. **Flow line corrosion of flexible metal Culverts:** Evidence of section loss as a result of corrosion of the barrel along the flow line, or presence of a vertical profile depression observed through visual inspection along the barrel alignment where water and debris can accumulate.

Applicable Flexactions include:

|          |                              |
|----------|------------------------------|
| CULVERT: | 48-C745301 - Barrel (Repair) |
|----------|------------------------------|

### Waterway Examples

6. **Advanced Scour at Substructure Unit(s):** Scour ranging from top of footing to minor 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 Scour Critical bridges 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 non-Scour Critical bridges 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-ECREMVG - 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 dependant 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)** on Page 3-359
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)** on Page 3-360.
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)<br>60-B744601 - Other members (Rep/Repl)<br>(Applicable to Substructure)                          |
| STEEL:                            | 25-A744602 - Stringer (Rep/Repl)<br>50-B744602 - Floorbeam (Rep/Repl)<br>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)<br>74-SSATTAC - Sign Attach (Rep/Repl)<br>78-SSCONNT - Struct Connection (Rep/Repl)            |
| DECK:                             | 35-B744301 - Timber Deck (Rep/Repl)<br>6-D744303 - Concrete Deck (Repair)<br>37-C744302 - Open Steel Grid (Rep/Repl)               |
| ABUTMENT - WING - PIER,ect.:      | 38-A744801 - Backwall (Rep/Repl)<br>28-B744802 - Abutments (Repair)<br>15-C744802 - Wing (Rep/Repl)<br>32-D744802 - Piers (Repair) |
| CULVERT:                          | 48-C745203 - Barrel (Repair)                                                                                                       |
| RETAINING WALLS:                  | 77-RTWALLR - Retaining Wall (Rep/Repl)<br>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)<br>(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) |
|-------------------------------|--------------------------------|

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) |
|----------------|------------------------------------|

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

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)

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)

#### 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 below.

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-RDSHLDR - 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 dependant 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)** on Page 3-359

9. **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)** on Page 3-360.

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 (3A06) |
|----------------------------------------------------------------------------------------------|----------------------------------------------------------------------|-------------------------------------|
| <b>(a). One lane bridges on two way roads</b><br>(Item 5C27 - Bridge Roadway Width < 16 ft)  | IA02 < 6                                                             | 2                                   |
|                                                                                              | IA02 ≥ 6                                                             | 3                                   |
| <b>(b). Narrow two lane bridges</b><br>(Item 5C27 - Bridge Roadway Width < 24 ft)            | IA02 < 6                                                             | 3                                   |
|                                                                                              | IA02 ≥ 6                                                             | 4                                   |
| <b>(c). All other bridges where Z-boards were installed, but are now missing or damaged.</b> | 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.

**IM06 Date Recom - Date Recommended**

(Old BMS Item H10)

**Description:**

This item is used to record the date the work candidate was recommended.

**Procedure:**

Enter the date on which the work candidate was recommended. For feasible actions it will be the date that the Pontis model generated the work item

**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****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 Eliminated – 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**

(Old BMS Item H12)

**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**

(Old BMS Item H03)

**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**

(Old BMS Item H06)

**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 - Eliminated", leave blank.

**IM11 Work Assign**

(Old BMS Item H09)

**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****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

### 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

(Old BMS Item N01)

### 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 - Eliminated", 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

### 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

### 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

### 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 7<sup>th</sup> and barriers put in place.
- #3 District contacted Contractor XYZ to mobilize for repairs.
- #4 Contractor arrived on sight on May 8<sup>th</sup> and began coffer dam construction. Expected to complete dam on May 9<sup>th</sup>.
- #5 Expected to complete repairs on May 11<sup>th</sup>.

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

### 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.

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**

### **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**

### **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.

## IM16 SAP Closed Date

**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

**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

(Old BMS Item N05)

**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

(Old BMS Item N06)

**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 #

**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.

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## IS Inspection - Signs / Lights

The Sign/High-Mast Light Inspection screen allows users to view and/or edit information related to sign structure and/or high-mast light inspections. This screen is applicable only when the user selects a sign or high-mast light structure on the Pontis desktop and creates a new inspection, or opens an existing inspection, for the sign/light using Pontis functionality.

Users may select the "BMS2 Sign/Light Structure Layout" from the Layout pull-down menu to retrieve a list of all sign structures and high mast lights. Once this layout is on the desktop, select a sign structure or high-mast light from the current structure list and click on the PA Insp applet to view inspection data. Users may also use the Find button to find a sign or high-mast light in the Pontis database.

Click the "C" for comment button next to an individual condition rating to open a modal dialog box that may be used to enter a comment regarding that rating. Once a comment has been entered for a rating, the label of the button will change to "C\*\*\*".

The screenshot shows the 'PennDOT BMS2 Inspection Applet' window. At the top, there are fields for 'Sign/Light:' and 'Inspections (2):', a radio button for 'Metric' or 'English', and a 'Save' button. Below this is a toolbar with icons for help, print, and other functions. A tab labeled 'Signs/Lights' is selected. The main area contains several sections:

- Inspection Information:** Fields for 'Structure Type:' and 'IS01 Primary Inspection Type:'.
- Condition Ratings:** A grid of 10 items, each with a dropdown menu and a 'C' button. The items are: IS02 Foundation, IS03 Guide Rail, IS04 Column, IS05 Method of Access, IS06 Sign, IS07 Lights, IS08 Surface/Paint, IS09 Horizontal Member/Frame, and IS10 Overall. The 'C' buttons for IS02 through IS06 are currently labeled 'C'.
- IS11 Notes:** A text area with a small icon in the bottom right corner.
- Next Inspection Information:** Fields for 'IS12 Next Inspection Type:', 'IS13 Next Inspection Freq:' (with a dropdown menu), and 'IS14 Next Inspection Date:' with a 'Calc' button.

## IS01 Primary Inspection Type - Inspection Type for Sign Structure

(Old BMS Items S01-A and E07)

### Description:

This item is used to record the type of inspection that was performed on the sign structure.

### Procedure:

Select the code from the dropdown list that describes the type of inspection that was performed on the sign structure.

### Coding:

- A Initial Inventory – All of sign structure's inventory data is collected along with performance of "in-depth" inspection as described next.
- B In-depth – A close visual and hands-on examination of each component, member, fastener, and weld on sign structure. Existing inventory data is to be updated. Each lane of traffic beneath structure is closed in turn to permit direct access from bucket truck.
- C 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.
- D Routine – a close visual and hands-on examination of all portions of sign structure including columns, portions of horizontal members, etc., which can be accessed without traffic control. Those portions which cannot be accessed safely from beyond the edge of pavement are viewed using binoculars. Existing inventory data is to be updated.
- E 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.

## Condition Rating Codes Used for Sign 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 | <b>Not Applicable.</b>                                                                                                                                                  |
| 8 | <b>Good Condition</b> – No apparent problems.                                                                                                                           |
| 6 | <b>Satisfactory Condition</b> – Structural elements sound. Minor cracking, loose bolts, missing safety chains, broken lights.                                           |
| 4 | <b>Poor Condition</b> – Moderate structural cracking, missing bolts, missing nuts, significant corrosion, minor collision damage.                                       |
| 2 | <b>Critical</b> – 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**

(Old BMS Item S22)

**Description:**

This item indicates the condition of the base of the column of the sign structure.

**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 above.

**IS03 Guide Rail - Guiderail Condition Rating**

(Old BMS Item S23)

**Description:**

This item indicates the condition of the guiderail in front of sign structure.

**Procedure:**

Select the code from the dropdown list which indicates the condition of the guiderail, if applicable.

**Coding:**

Refer to CONDITION RATING CODES listed above.

**IS04 Column - Column Condition Rating**

(Old BMS Item S24)

**Description:**

This item indicates the condition of the column(s).

**Procedure:**

Select the code from the dropdown list which indicates the condition of the column(s).

**Coding:**

Refer to CONDITION RATING CODES listed on Page 3-371.

**IS05 Method of Access - Access Condition Rating**

(Old BMS Item S25)

**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 Page 3-371.

**IS06 Sign - Sign Condition Rating**

(Old BMS Item S26)

**Description:**

This item indicates the structure condition of the sign(s). Do not rate legibility and visibility of the sign.

**Procedure:**

Select the code from the dropdown list which indicates the structural condition of the sign(s) and connections, if applicable.

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 Page 3-371.

**IS07 Lights - Light Condition Rating**

(Old BMS Item S27)

**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 Page 3-371.

**IS08 Surface/Paint - Surface Condition Rating**

(Old BMS Item S28)

**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**

(Old BMS Item S29)

**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.

**Coding:**

Refer to CONDITION RATING CODES listed on Page 3-371.

## IS10 Overall - Overall Condition Rating of the Sign Structure (Old BMS Item S30)

### 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 Page 3-371.

## IS11 Notes - Inspection Notes

(Old BMS Items S31 to S37)

### 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 Structure

(Old BMS Item S02-A)

### Description:

This item is used to record the next type of inspection recommended to be performed on the sign structure.

### 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 Structure (Old BMS Items S02 and E01)

### Description:

This item is used to record the frequency of the sign structure inspection in months.

### Procedure:

Enter the frequency of sign structure inspection in months. (The frequency will be established in the future. No policy has yet been established. However, signs in poor condition should be inspected at no greater than a 12 month frequency).

### Coding:

The inspection frequency, in months. Prefix with zeros where necessary.

## IS14 Next Inspection Date - Complete Next Inspection By This Date

### Description:

This item is used to record the date by which the next inspection is to be completed.

### 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 "Calc" 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         |

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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 on the Pontis desktop and creates a new inspection or opens an existing inspection for the wall using Pontis functionality. Use the structure pick-list to select a retaining wall or noise wall from the current structure list on the Pontis desktop.

Users may select the "BMS2 Wall Layout" from the Layout pull-down menu to retrieve a list of all walls. Once this layout is on the desktop, select a wall from the current structure list and click on the **PA Insp** applet to view inspection data. Users may also use the Find button to find a wall in the Pontis database.

Click the "C" for comment button next to an individual condition rating to open a modal dialog box that may be used to enter a comment regarding that rating. Once a comment has been entered for a rating, the label of the button will change to "C\*\*\*".

**Inspection Information:**

- Structure Type: [dropdown]
- IW01 Primary Inspection Type: [dropdown]
- VW06 Backfill/Damping 1: [dropdown]
- VW07 Backfill/Damping 2: [dropdown]

**Condition Ratings:**

|                                   |   |                             |   |
|-----------------------------------|---|-----------------------------|---|
| IW02 Anchorage: [dropdown]        | C | IW07 Drainage: [dropdown]   | C |
| IW03 Backfill/Damping: [dropdown] | C | IW08 Foundation: [dropdown] | C |
| IW04 Wall: [dropdown]             | C | IW09 Parapets: [dropdown]   | C |
| IW05 Panel: [dropdown]            | C | IW10 Overall: [dropdown]    | C |
| IW06 Post: [dropdown]             | C |                             |   |

**Notes:** IW11 Notes: [text area]

**Next Inspection Information:**

- IW12 Next Inspection Type: [dropdown]
- IW13 Next Inspection Freq: [dropdown] months
- IW14 Next Inspection Date: [date input] Calc [button]

### IW01 Primary Inspection Type - Inspection Type for Wall Structure (Old BMS Item E07)

#### 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 | Type                    | 24 month<br>NBI Insp.<br>Interval | < 24 month<br>NBI Insp.<br>Interval | Comments                                                                                                                                                                                                |
|------|-------------------------|-----------------------------------|-------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A    | Access Equipment Only   | No                                | No                                  | Follow-up with access equipment (e.g. crane, lift, rigging) to complete inspection of remote bridge elements                                                                                            |
| B    | Damage                  | No                                | No                                  | Not a full NBIS Inspection – limited to damaged elements. An inspection crane may be used.                                                                                                              |
| C    | Routine Using Crane     | Yes                               | Yes                                 | NBIS. A complete routine NBIS inspection where the inspection crane is utilized.                                                                                                                        |
| D    | In-Depth                | No                                | No                                  | If In-Depth inspection scope meets/exceeds requirements for Routine inspection, code "R". For in-depth inspections scoped for critical areas only, code "D". An inspection crane may be used.           |
| E    | Element Inventory Only  | No                                | No                                  | Inventory of element level data only.                                                                                                                                                                   |
| F    | Initial (First Time)    | Yes                               | N/A                                 | NBIS. For 8' - 20' bridges also.                                                                                                                                                                        |
| G    | Fracture Critical       | No                                | No                                  | <b>Do Not Use</b> Historical information only for code identification from superseded BMS AJ screen.                                                                                                    |
| H    | Highway Environs Only   | Yes                               | N/A                                 | Inspection of non-highway bridges/structures over highways. Inspection limited to highway environs.                                                                                                     |
| I    | Interim (Special)       | No                                | Yes                                 | For 8' - 20' bridges also. Not a complete NBIS inspection. A special inspection limited to critical areas to meet reduced inspection interval. Otherwise use 7A03 = P. An inspection crane may be used. |
| M    | Miscellaneous           | Yes                               | Yes                                 | NBIS-like inspection of other miscellaneous structures.                                                                                                                                                 |
| O    | Overhead Non-Highway    | Yes                               | Yes                                 | NBIS-like inspection of structural components of overhead non-highway bridges.                                                                                                                          |
| P    | Problem Area (Special)  | No                                | No                                  | Not a Complete NBIS inspection. One time inspection limited to critical area(s). An inspection crane may be used.                                                                                       |
| R    | Regular (Routine)       | Yes                               | Yes                                 | NBIS. For 8' - 20' bridges also. Includes probing of substructure units (by wading only) for bridges over water.                                                                                        |
| S    | Sign Structure          | Yes                               | Yes                                 | NBIS-like inspection for sign structures. An inspection crane may be used.                                                                                                                              |
| T    | Retaining Wall          | Yes                               | Yes                                 | NBIS-like inspection for retaining walls and noise walls.                                                                                                                                               |
| U    | Underwater Only         | No                                | No                                  | Stand alone underwater inspection of substructure units by diving. (Primary Inspection date is date of the underwater inspection).                                                                      |
| W    | Routine with Underwater | Yes                               | Yes                                 | NBIS. For 8' - 20' bridges also. Underwater inspection of substructure units is performed by diving. (Primary Inspection date and underwater inspection date occur on same day).                        |
| X    | Unknown                 | N/A                               | N/A                                 |                                                                                                                                                                                                         |
| Z    | Inventory Only          | No                                | No                                  |                                                                                                                                                                                                         |

Old BMS codes:

- 1 Initial NBIS
- 2 Regular NBIS
- 3 Regular NBIS including underwater

- |   | <u>Codes 4-9 special inspections</u>           |
|---|------------------------------------------------|
| 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                                |

## 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

### 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 Rating Codes on this page.

## IW03 Backfill/Damping - Backfill Condition Rating

(Old BMS Item T13)

**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 Page 3-379.

## IW04 Wall - Wall Condition Rating

(Old BMS Item T14)

**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 Page 3-379.

## IW05 Panel - Panel Condition Rating

**Description:**

This item indicates the condition of sound wall panels.

**Procedure:**

Select the code from the dropdown list which indicates the condition of the sound wall panel.

**Coding:**

Refer to CONDITION RATING CODES on Page 3-379.

## IW06 Post - Post Condition Rating

**Description:**

This item indicates the condition of sound wall posts.

**Procedure:**

Select the code from the dropdown list which indicates the condition of the sound wall posts.

**Coding:**

Refer to CONDITION RATING CODES on Page 3-379.

**IW07 Drainage - Drainage Condition Rating**  
(Old BMS Item T15)**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 Page 3-379.

**IW08 Foundation - Foundation Condition Rating**  
(Old BMS Item T16)**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 Page 3-379.

**IW09 Parapets - Parapets Condition Rating****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 Page 3-379.

## IW10 Overall - Overall Condition Rating of the Wall

(Old BMS Item T17)

### 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 Page 3-379.

## IW11 Notes - Wall Inspection Notes

(Old BMS Items T18 to T24)

### 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

### 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 of sign structure, item IW01

## IW13 Next Inspection Freq - Frequency of Inspection of Wall Structure

(Old BMS Items T02 and E01)

### Description:

This item is used to record the frequency of the wall structure inspection in months.

**Procedure:**

Enter the frequency, in months, that the wall is to be inspected. The recommended frequency is 24 months.

**Coding:**

The inspection frequency, in months.

**\*IW14 Next Inspection Date - Complete Next Inspection By This Date****Description:**

This item is used to record the date by which the next inspection is to be completed.

**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 "Calc" 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

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## IO Inspection – Miscellaneous Other Structures

The Inspection - Miscellaneous Other Structures screen allows users to view and/or edit information related to inspections for miscellaneous structures (i.e., those structures for which a custom inspection screen has not been provided). This screen is applicable only when the user selects a miscellaneous structure on the Pontis desktop and creates a new inspection or opens an existing inspection for the miscellaneous structure using Pontis functionality. Use the structure pick-list to select a miscellaneous structure from the current structure list on the Pontis desktop. Use the inspection pick-list to select an inspection for the current miscellaneous structure. Click the Find button to find a miscellaneous structure in the Pontis database. Click the Save button to save the current miscellaneous structure inspection.

The screenshot shows the 'PennDOT BMS2 Inspection Applet' window. At the top, there are fields for 'Miscellaneous:' and 'Inspection:', both with dropdown menus. To the right of these are radio buttons for 'Metric' and 'English', and several small icons. Below the header is a tab labeled 'Miscellaneous' which is selected. The main area contains four sections: 'Inspection Information' with dropdowns for IO01, IO02, and IO03; 'Condition Ratings' with a dropdown for IO04; 'IO05 Notes' with a text area and a small icon; and 'Next Inspection Information' with dropdowns for IO06, IO07, and IO08 with a 'Calc' button.

### \*IO01 Type of Service On – Type of Service On Structure (Old BMS Item A26)

#### Description:

This display only item indicates the type of service on the structure.

#### Procedure:

This item will be automatically filled in based on the information from Item VO02. This item is display only and requires no user input.

**Coding:**

Type of service carried by the structure.

- 0 Private Road/Other
- M Miscellaneous Structure
- T Tunnel

**Note:**

Streets should be treated as highways, not a private road or other. A private road is a highway, road or street not under public authority jurisdiction, not maintained by public authority and not open to the public.

**Examples:**

Tunnel:

 **\*IO02 Type of Service Under - Type of Service Under Structure**

(Old BMS Item A26)

**Description:**

This display only item indicates the type of service under the structure.

**Procedure:**

This item will be automatically filled in based on the information from Item 5A18. This item is display only and requires no user input.

**Coding:**

Type of service passing under the structure.

- |                                |                                 |
|--------------------------------|---------------------------------|
| 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:**

Streets should be treated as highways, not a private road or other. A private road is a highway, road or street not under public authority jurisdiction, not maintained by public authority and not open to the public.

**IO03 Primary Inspection Type - Inspection Type for Structure**

(Old BMS Item E07)

**Description:**

This item is used to record the type of inspection that was performed on the structure.

**Procedure:**

Select the code from the dropdown list that describes the type of inspection that was performed on the structure.

**Coding:**

| IO03 | Type                    | 24 month<br>NBI Insp.<br>Interval | < 24 month<br>NBI Insp.<br>Interval | Comments                                                                                                                                                                                                |
|------|-------------------------|-----------------------------------|-------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A    | Access Equipment Only   | No                                | No                                  | Follow-up with access equipment (e.g. crane, lift, rigging) to complete inspection of remote bridge elements                                                                                            |
| B    | Damage                  | No                                | No                                  | Not a full NBIS Inspection – limited to damaged elements. An inspection crane may be used.                                                                                                              |
| C    | Routine Using Crane     | Yes                               | Yes                                 | NBIS. A complete routine NBIS inspection where the inspection crane is utilized.                                                                                                                        |
| D    | In-Depth                | No                                | No                                  | If In-Depth inspection scope meets/exceeds requirements for Routine inspection, code "R". For in-depth inspections scoped for critical areas only, code "D". An inspection crane may be used.           |
| E    | Element Inventory Only  | No                                | No                                  | Inventory of element level data only.                                                                                                                                                                   |
| F    | Initial (First Time)    | Yes                               | N/A                                 | NBIS. For 8' - 20' bridges also.                                                                                                                                                                        |
| G    | Fracture Critical       | No                                | No                                  | <b>Do Not Use</b> Historical information only for code identification from superseded BMS AJ screen.                                                                                                    |
| H    | Highway Environs Only   | Yes                               | N/A                                 | Inspection of non-highway bridges/structures over highways. Inspection limited to highway environs.                                                                                                     |
| I    | Interim (Special)       | No                                | Yes                                 | For 8' - 20' bridges also. Not a complete NBIS inspection. A special inspection limited to critical areas to meet reduced inspection interval. Otherwise use 7A03 = P. An inspection crane may be used. |
| M    | Miscellaneous           | Yes                               | Yes                                 | NBIS-like inspection of other miscellaneous structures.                                                                                                                                                 |
| O    | Overhead Non-Highway    | Yes                               | Yes                                 | NBIS-like inspection of structural components of overhead non-highway bridges.                                                                                                                          |
| P    | Problem Area (Special)  | No                                | No                                  | Not a Complete NBIS inspection. One time inspection limited to critical area(s). An inspection crane may be used.                                                                                       |
| R    | Regular (Routine)       | Yes                               | Yes                                 | NBIS. For 8' - 20' bridges also. Includes probing of substructure units (by wading only) for bridges over water.                                                                                        |
| S    | Sign Structure          | Yes                               | Yes                                 | NBIS-like inspection for sign structures. An inspection crane may be used.                                                                                                                              |
| T    | Retaining Wall          | Yes                               | Yes                                 | NBIS-like inspection for retaining walls and noise walls.                                                                                                                                               |
| U    | Underwater Only         | No                                | No                                  | Stand alone underwater inspection of substructure units by diving. (Primary Inspection date is date of the underwater inspection).                                                                      |
| W    | Routine with Underwater | Yes                               | Yes                                 | NBIS. For 8' - 20' bridges also. Underwater inspection of substructure units is performed by diving. (Primary Inspection date and underwater inspection date occur on same day).                        |
| X    | Unknown                 | N/A                               | N/A                                 |                                                                                                                                                                                                         |
| Z    | Inventory Only          | No                                | No                                  |                                                                                                                                                                                                         |

Old BMS codes:

|                                     | <u>Codes 4-9 special inspections</u>             |
|-------------------------------------|--------------------------------------------------|
| 1 Initial NBIS                      | 4 Problem areas only (existing and/or potential) |
| 2 Regular NBIS                      | 5 Special areas only - management directed       |
| 3 Regular NBIS including underwater | 6 Personnel lift only                            |
|                                     | 7 Inspection crane only                          |
|                                     | 8 Rigging Only                                   |
|                                     | 9 Underwater only                                |

## IO04 Overall - Overall Condition Rating of the Structure

(Old BMS Item E24)

### Description:

This item indicates the overall 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.

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.

### Coding:

- N     **Not Applicable.**
- 8     **Good Condition** – No apparent problems.
- 6     **Satisfactory Condition** – Structural elements sound. Minor cracking, loose bolts.
- 4     **Poor Condition** – Moderate structural cracking, missing bolts, missing nuts, significant corrosion.
- 2     **Critical** – Major structural defects, loose components that could fall on roadway. Excessive weld cracking.

#### Note:

Codes of 1, 3, 5, 7 and 9 are acceptable, but not recommended.

## IO05 Notes - Inspection Notes

### 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.

## IO06 Next Inspection Type - Next Inspection Type for Structure

### Description:

This item is used to record the next type of inspection recommended to be performed on the structure.

### Procedure:

Select the code from the dropdown list that describes the next type of inspection recommended to be performed on the structure.

### Coding:

See Item IO03 for values.

## IO07 Next Inspection Freq - Frequency of Inspection of Structure

(Old BMS Item E01)

### Description:

This item is used to record the frequency of the structure inspection in months.

### Procedure:

Enter the frequency of structure inspection in months.

### Coding:

The inspection frequency, in months.

## \*IO08 Next Inspection Date - Complete Next Inspection By This Date

### Description:

This item is used to record the date by which the next inspection is to be completed.

### 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 "Calc" 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

## 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.

**PennDOT BMS2 Feature Intersected Applet**

Bridge: [ ]

Metric English ? Print X X Save

Utility RailRoad Waterway

| FT01 Utility Name | FT02 Utility Type | FT03 License Num |
|-------------------|-------------------|------------------|
| [ ]               | [ ]               | [ ]              |

Create Remove

**Utility Detail**

|                        |                                       |
|------------------------|---------------------------------------|
| FT01 Utility Name: [ ] | FT02 Utility Type: [ ]                |
| FT03 License Num: [ ]  | FT04 License Issue Dt: [ ]            |
| FT06 Utility Addr: [ ] | FT05 Utility Weight: [ ] Kips         |
| FT08 Location: [ ]     | FT07 Hazmat: <input type="checkbox"/> |
| FT09 Contact Info: [ ] | FT10 Notes: [ ]                       |

### FT01 Utility Name - Name of Utility Company (Old BMS Item D02)

#### 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

**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 (Old BMS Item D03)

**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 (Old BMS Item D04)

**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 (Old BMS Item D05)

**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 (Old BMS Item D02)

**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

**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

**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

**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

**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.

## 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.

If a structure has a predefined list of railroad intersecting features, they are displayed on the Railroads grid. The grid list can be sorted for each column by clicking on the desired column heading. Detailed information for each feature may be displayed and edited by selecting the desired feature from the grid list.

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<br>Railroad Name | FR02<br>On/Under |  |
|-----------------------|------------------|--|
| 12 - 2nd Route On     |                  |  |

**Railroad Detail**

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                  |                             |    |                             |    |                            |    |                             |    |                    |    |                     |    |                       |    |                        |    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|-----------------------------|----|-----------------------------|----|----------------------------|----|-----------------------------|----|--------------------|----|---------------------|----|-----------------------|----|------------------------|----|
| FR01 RR Name:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | FR02 On/Under: 12 - 2nd Route On |                             |    |                             |    |                            |    |                             |    |                    |    |                     |    |                       |    |                        |    |
| FR03 Service Status:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | FR04 RR Milepost: .00            |                             |    |                             |    |                            |    |                             |    |                    |    |                     |    |                       |    |                        |    |
| FR05 AAR DOT Num:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | FR06 Num of Electrified Tracks:  |                             |    |                             |    |                            |    |                             |    |                    |    |                     |    |                       |    |                        |    |
| FR07 Total Num of Tracks:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | FR08 Span Desc:                  |                             |    |                             |    |                            |    |                             |    |                    |    |                     |    |                       |    |                        |    |
| FR09 Additional Operator:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                  |                             |    |                             |    |                            |    |                             |    |                    |    |                     |    |                       |    |                        |    |
| <b>Clearance</b> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">4A20 Min Lat Under (Left):</td> <td style="width: 50%;">ft</td> <td style="width: 50%;">4A19 Min Lat Under (Right):</td> <td style="width: 50%;">ft</td> </tr> <tr> <td>FR10 Min Over Vert (Left):</td> <td>ft</td> <td>FR11 Min Over Vert (Right):</td> <td>ft</td> </tr> <tr> <td>FR12 Horiz (Left):</td> <td>ft</td> <td>FR13 Horiz (Right):</td> <td>ft</td> </tr> <tr> <td>FR14 Def Vert (Left):</td> <td>ft</td> <td>FR15 Def Vert (Right):</td> <td>ft</td> </tr> </table> |                                  | 4A20 Min Lat Under (Left):  | ft | 4A19 Min Lat Under (Right): | ft | 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 |
| 4A20 Min Lat Under (Left):                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | ft                               | 4A19 Min Lat Under (Right): | ft |                             |    |                            |    |                             |    |                    |    |                     |    |                       |    |                        |    |
| 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:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                  |                             |    |                             |    |                            |    |                             |    |                    |    |                     |    |                       |    |                        |    |

### FR01 RR Name - Name of Railroad

(Old BMS Item B13)

#### 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.

**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 Lackawana & 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 & Youghiogheny 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 On/Under - Is the Feature Intersected On or Under the Bridge?

### Description:

This item indicates whether the feature intersected is on or under the bridge being inventoried.

### Procedure:

Select the code from the dropdown list that indicates whether the feature intersected is on or under the bridge being inventoried.

### Coding:

"X" Route On

"X" Route Under

## FR03 Service Status - Service Status of Railroad

(Old BMS Item B13)

### 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

(Old BMS Item B15)

### Description:

This item is used to enter the railroad milepost at which the structure is located. Locating a structure by mileposting is similar to the mileposting system used on our Interstate Highway routes.

### Procedure:

Enter the railroad milepost at which the structure is located.

### Coding:

Railroad milepost to the nearest hundredth of a mile.

## FR05 AAR DOT Num - Association of American Railroads Identifying Number

(Old BMS Item B14)

### 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.

### Coding:

Enter the AAR Number for the specific structure.

## FR06 Num of Electrified Tracks - Number of Electrified Railroad Tracks

(Old BMS Item B12)

### 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

(Old BMS Item B11)

### 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

### 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.

## FR09 Additional Operator

**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.

**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 Min Over Vert (Left) - Minimum Vertical Clearance for the Left Roadway (Old BMS Item B22)

**Description:**

This item is used to record the actual minimum vertical clearance over the features (streets, highways, railroads) to any restriction, to the nearest hundredth of a foot.

**Procedure:**

In the old BMS the vertical clearance for railroads was to be entered in the "Right Roadway" sub-field and the "Left Roadway" sub-field was to be left blank. This procedure shall continue until further direction is provided.

**Coding:**

Leave this item blank or code as "0" until further direction is provided.

## FR11 Min Over Vert (Right) - Minimum Vertical Clearance for the Right Roadway (Old BMS Item B22)

**Description:**

This item is used to record the actual minimum vertical clearance over the features (streets, highways, railroads) to any restriction, to the nearest hundredth of a foot.

**Procedure:**

If the feature beneath the structure is a railroad <sup>(1)</sup>, 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 (Applicable for Old BMS only. BMS2 allows users to enter clearances greater than 100 feet.)

**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 Horiz (Left) - Total Horizontal Clearance for the Left Roadway**

(Old BMS Item B21)

**Description:**

This item is used to record the total horizontal clearance for features which are identified as streets or highways.

**Procedure:**

In the old BMS the horizontal clearance for railroads was to be entered in the "Right Roadway" sub-field and the "Left Roadway" sub-field was to be left blank. **This procedure shall continue until further direction is provided.**

**Coding:**

Leave this item blank or code as "0" until further direction is provided.

**FR13 Horiz (Right) - Total Horizontal Clearance for the Right Roadway**

(Old BMS Item B21)

**Description:**

This item is used to record the total horizontal clearance for features which are identified as streets or highways.

**Procedure:**

The total horizontal clearance should be the available clearance measured between the most restrictive features . . . curbs, rails, walls or other structural feature limiting the railroad <sup>(2)</sup>.

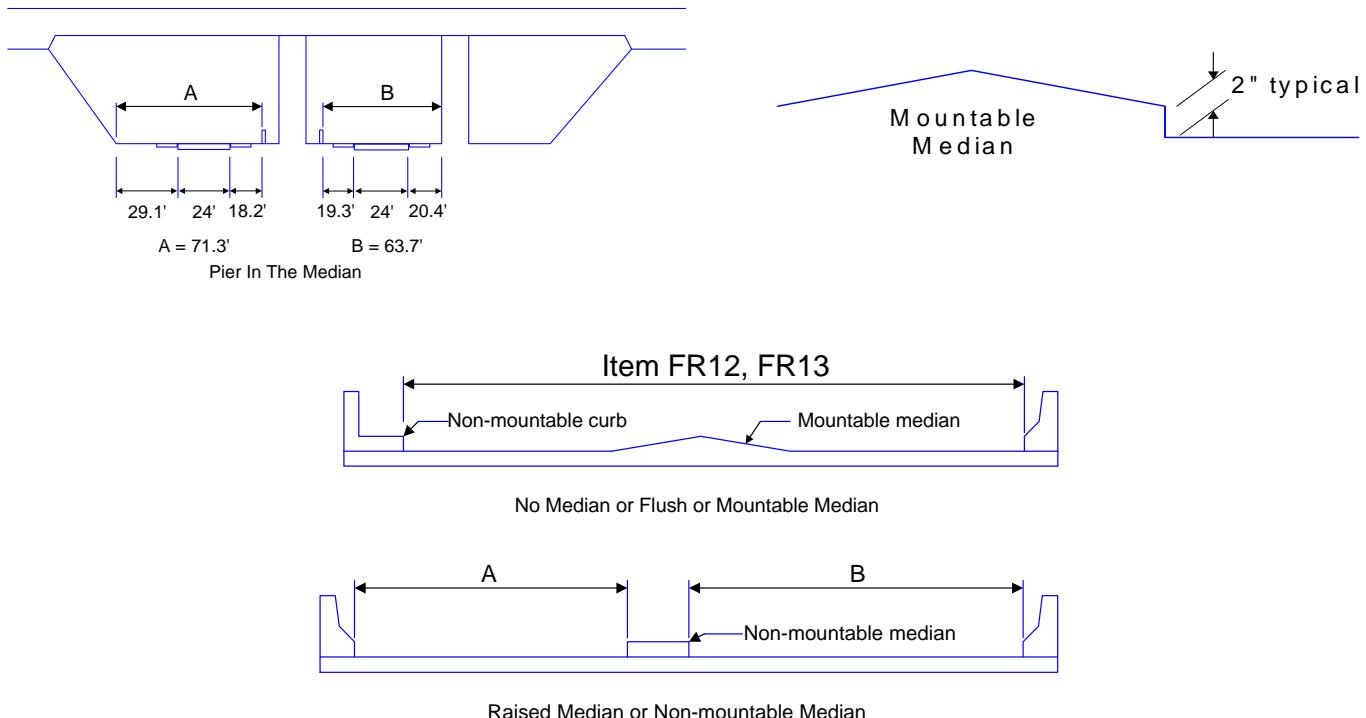
**Coding:**

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 100 feet.)  
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 Def Vert (Left) - Vertical Clearance Over 10 Ft Width (Defense Highways) for Left Roadway

(Old BMS Item B23)

### 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:

In the old BMS the defense vertical clearance for railroads was to be entered in the "Right Roadway" sub-field and the "Left Roadway" sub-field was to be left blank. **This procedure shall continue until further direction is provided.**

### Coding:

Leave this item blank or code as "0" until further direction is provided.

## FR15 Def Vert (Right) - Vertical Clearance Over 10 Ft Width (Defense Highways) for Right Roadway

(Old BMS Item B23)

### 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.

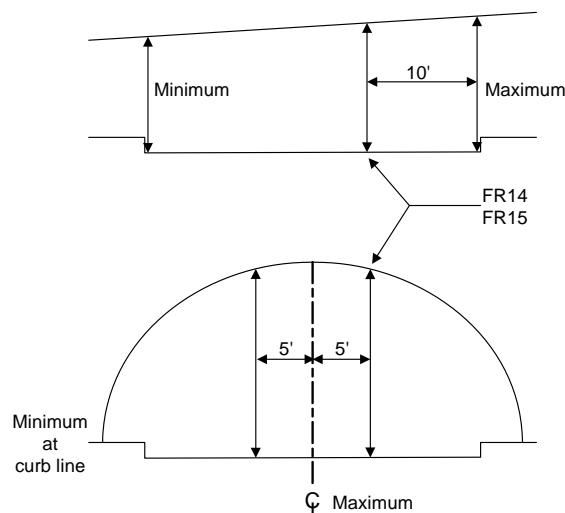
### Procedure:

If the feature beneath the structure is a railroad <sup>(1)</sup>, enter the vertical clearance from the railroad track to the underside of the superstructure.

### Coding:

Vertical clearance to the nearest hundredth of a foot.

- |       |                                                                                                                                                |
|-------|------------------------------------------------------------------------------------------------------------------------------------------------|
| 9912  | Vertical clearance of 100 feet or greater<br>(Applicable for Old BMS only. BMS2<br>allows users to enter clearances greater<br>than 100 feet.) |
| 9999  | Unlimited vertical clearance                                                                                                                   |
| Blank | Not applicable                                                                                                                                 |



### Note:

(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.

The 10' width envelope is measured from the point of maximum vertical clearance toward a point of lesser clearance. See sketch.

## FR16 Notes

### Description:

This item is used to record any comments about the feature.

### Procedure:

Enter any comments about the feature in narrative form.

## 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.

**PennDOT BMS2 Feature Intersected Applet**

**Sign/Light:** 22002200501171      **Metric** **English**      **?** **Print** **Back** **Forward** **Save**

**Utility | RailRoad | Waterway**

|                                                                             |                                                                 |                                       |                                       |
|-----------------------------------------------------------------------------|-----------------------------------------------------------------|---------------------------------------|---------------------------------------|
| 4A21 Nav Control Exists: <input type="button" value="..."/> - Unknown (NBI) | 4A23 Nav Horizontal Clr: <input type="text" value="-1.000 ft"/> |                                       |                                       |
| 4A22 Nav Vertical Clr: <input type="text" value="-1. ft"/>                  | 4A24 Min Vert Lft Clr: <input type="text" value="-1. ft"/>      |                                       |                                       |
| <b>FW01 Stream Name</b>                                                     | <b>5C03 On_Under</b>                                            | <b>FW09 Waterflow Direction</b>       | <b>FW10 Primary Waterway</b>          |
| A - 1st Route Under                                                         |                                                                 | <input type="button" value="Create"/> | <input type="button" value="Remove"/> |

**Waterway Detail**

|                                                    |                                                                                           |                                         |
|----------------------------------------------------|-------------------------------------------------------------------------------------------|-----------------------------------------|
| FW01 Stream Name: <input type="text"/>             | FW02 Stream Classification 1: <input type="text"/>                                        |                                         |
| FW03 Stream Classification 2: <input type="text"/> | FW04 Timeframe: <input type="text"/>                                                      |                                         |
| FW05 Stream Classification 3: <input type="text"/> | FW06 Permit Type: <input type="text"/>                                                    |                                         |
| FW07 Drainage Area: <input type="text"/> sq.mi     | FW08 Fishable: <input type="checkbox"/> FW09 WaterFlow Direction: <input type="text"/>    |                                         |
| FW11 Vertical Clearance: <input type="text"/> ft   | Design Flood Data                                                                         |                                         |
| FW12 Max W.S Elevation: <input type="text"/> ft    | FW14 Magnitude: <input type="text"/> cfs                                                  | FW15 Elevation: <input type="text"/> ft |
| FW13 Max W.S. Elevation Year: <input type="text"/> | FW16 Frequency: <input type="text"/>                                                      | FW17 Velocity: <input type="text"/> fps |
| FW18 Pollutant Desc: <input type="text"/>          | <input style="width: 100px; height: 20px; margin-left: 10px;" type="button" value="..."/> |                                         |

### FW01 Stream Name - Name of the Stream (Creek, River, etc.) (Old BMS Items B03 and D06)

#### 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

**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

**Description:**

This item is used to record the second stream classification.

**Procedure:**

Select the second stream classification from the dropdown list.

**Coding:**

Same as FW02.

**FW04 Reserved****Description:**

This item is reserved for future use.

**FW05 Stream Classification 3****Description:**

This item is used to record the third stream classification.

**Procedure:**

Select the third stream classification from the dropdown list.

**Coding:**

Same as FW02.

**FW06 Permit Type****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**

(Old BMS Item D07)

**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)?

(Old BMS Item D11)

### 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 in the Department's DM2, Chapter 10, Appendix 10.A. If the stream is fishable (stockable), check the box. If the stream is not fishable (stockable), or 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

### 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:

- |   |                                                              |
|---|--------------------------------------------------------------|
| R | Water flows from Left side of bridge to Right side of bridge |
| L | Water flows from Right side of bridge to Left side of bridge |

## FW10 Primary Waterway

### 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 (Old BMS Item D08)

### 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.

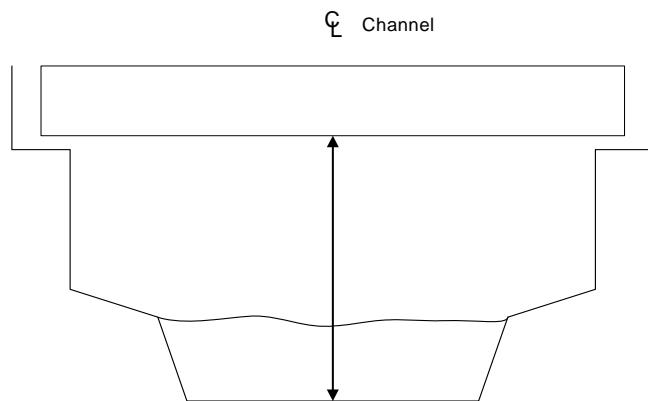
### Coding:

The nominal vertical clearance to the nearest tenth of a foot.

#### Example:

Assume a nominal vertical clearance of 11'-7"

11.6



## FW12 Max W.S. Elevation - Maximum Known Water Surface Elevation (Old BMS Item D10)

### 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**

(Old BMS Item D10)

### **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**

(Old BMS Item D09)

### **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**

(Old BMS Item D09)

### **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**

(Old BMS Item D09)

### **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**

(Old BMS Item D09)

**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****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****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

### Description:

This item is used to record any notes on the waterway.

### Procedure:

Enter a narrative description for any additional notes on the waterway.

## 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.

| Span Seq No | SP01 Span Type | SP02 Label | SP03 Span Length ft | SP04 Span Deck Width | SP05 Flared                         | SP06 Span Description | SP07 Dept Material Typ | SP08 Dept Physical Typ | SP09 Dept Span Inter | SP10 Dept Struc Config |
|-------------|----------------|------------|---------------------|----------------------|-------------------------------------|-----------------------|------------------------|------------------------|----------------------|------------------------|
| 1           | Apras          | 01ZC       | -1.                 | .00                  | <input checked="" type="checkbox"/> | APRAS Span            |                        |                        |                      |                        |

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 Span Type

**Description:**

This item is used to record the span member and the main or approach span.

**Procedure:**

Select the type of span from the dropdown list.

**Coding:**

Main  
Approach  
Apras

## SP02 Label

**Description:**

This item is used to record the span label.

**Procedure:**

Enter the span label in narrative form.

**Coding:**

Span label in narrative form.

## SP03 Span Length

(Old BMS Item C17)

**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' span  | <input type="text" value="088.48"/> |

## SP04 Span Deck Width

### 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

### 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

### 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.

## SP07 to SP10 Dept Material Type, Dept Physical Typ, Dept Span Inter, Dept Struc Config - Department Structure Type

(Old BMS Item PA09)

### 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.

## 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.

| Apras Span Seq No | SS01 Apras Span Id | SS02 Actual Span | SS03 BackSpan | SS04 Ident Span | SS05 Beg Cont | SS06 End Cont | SS07 C-C-Len ft | SS08 Mom Comp Len | SS09 Dept Struc Type | SS10 Notes |
|-------------------|--------------------|------------------|---------------|-----------------|---------------|---------------|-----------------|-------------------|----------------------|------------|
| 1                 |                    |                  |               |                 |               |               |                 |                   |                      |            |
| 2                 |                    |                  |               |                 |               |               |                 |                   |                      |            |
| 3                 |                    |                  |               |                 |               |               |                 |                   |                      |            |

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 Apras Span ID

(Old BMS Item PA04)

#### 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 data sets 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 3<sup>rd</sup> and/or 4<sup>th</sup> 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 SS14). 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

### 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

(Old BMS Item PA04)

### 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.

(Old BMS Item PA05)

### 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 pan 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**

**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**

(Old BMS Item PA06)

**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.

## EXAMPLE 1: Simple Span Structure

| SS01<br>APRAS Span<br>ID | SS02<br>Actual Span | SS03<br>Back-Span | SS04<br>Identical Span<br>No | SS05<br>Begin<br>Continuous | SS06<br>End Continuous |
|--------------------------|---------------------|-------------------|------------------------------|-----------------------------|------------------------|
| 01B1                     | Main 1              |                   | 01                           |                             |                        |

## EXAMPLE 2: 4 Simple Spans, Identical for Spans 2 and 3, non-continuous

| SS01<br>APRAS Span<br>ID | SS02<br>Actual Span | SS03<br>Back-Span | SS04<br>Identical Span<br>No | SS05<br>Begin<br>Continuous | SS06<br>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<br>APRAS Span<br>ID | SS02<br>Actual Span | SS03<br>Back-Span | SS04<br>Identical Span<br>No | SS05<br>Begin<br>Continuous | SS06<br>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<br>APRAS Span<br>ID | SS02<br>Actual Span | SS03<br>Back-Span | SS04<br>Identical Span<br>No | SS05<br>Begin<br>Continuous | SS06<br>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<br>APRAS Span<br>ID | SS02<br>Actual Span | SS03<br>Back-Span | SS04<br>Identical Span<br>No | SS05<br>Begin<br>Continuous | SS06<br>End Continuous |
|--------------------------|---------------------|-------------------|------------------------------|-----------------------------|------------------------|
| 01W1                     | Main 1              |                   | 01                           |                             |                        |
| 02W1                     | Main 2              |                   | 02                           |                             |                        |
| 02W2                     | Main 2              | ✓                 |                              |                             |                        |

## EXAMPLE 6: Sign Structure

| SS01<br>APRAS Span<br>ID | SS02<br>Actual Span | SS03<br>Back-Span | SS04<br>Identical Span<br>No | SS05<br>Begin<br>Continuous | SS06<br>End Continuous |
|--------------------------|---------------------|-------------------|------------------------------|-----------------------------|------------------------|
| 01ZC                     | Apras 01ZC          |                   | 01                           |                             |                        |

## SS07 C-C-Len - Center to Center Span Length

(Old BMS Item PA08)

### 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 | 106.25 |
| 88.48' spa   | 088.48 |

## SS08 Mom Comp Len - Moment Comparison Span Length

(Old BMS Item PA10)

### 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:

- a) Moment Comparison Factor method is applicable.
- b) If the analysis length is less than the full span length.
- c) 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.

## SP09 Dep Struc Typ - Department Structure Type

(Old BMS Item PA09)

### 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

**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

(Old BMS Item PA01)

**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

Over I-83

## SS12 Axle Weight

(Old BMS Item PA03)

### 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

(Old BMS Item PA02)

### 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 accessed by clicking on the APRAS Span applet button on the Inspection Desktop. At the top of the screen is the Select Structure section.

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 select one or more records and use the remove button to delete the records. Users will be prompted by the system to confirm deletion before the records are removed.

**PennDOT BMS2 Apras Span Data Applet**

Sign/Light: 22002200501171 Metric English ? Save

Span | Apras Span | **Load Capacity** | Load Capacity Details | Clearance |

SS01 Span Id Suffix: 01ZC Remove

|                           |            |                                |            |
|---------------------------|------------|--------------------------------|------------|
| SL01 Rating Date:         | 7/6/2000   | SL06 Pos Mom Comp Factor Norm: | -1.000     |
| SL02 DF Moment Norm:      | -1.000     | SL07 Pos Mom Comp Factor Rest: | -1.000     |
| SL03 DF Moment Single:    | -1.000     | SL08 Neg Mom Comp Factor Norm: | -1.00      |
| SL04 DF Shear Norm:       | -1.000     | SL09 Neg Mom Comp Factor Rest: | -1.000     |
| SL05 DF Shear Single:     | -1.000     | SL10 Load Condition:           | [dropdown] |
| SL11 Single Lane Span Id: |            |                                |            |
| 1st                       |            |                                |            |
| SL12 Restrict Span Id:    |            |                                |            |
| SL13 Restrict Code:       | [dropdown] | [dropdown]                     | [dropdown] |
| 2nd                       |            |                                |            |
| SL14 Restrict Span Id:    |            |                                |            |
| SL15 Restrict Code:       | [dropdown] | [dropdown]                     | [dropdown] |
| SL16 Rating Notes:        |            |                                |            |

### SL01 Rating Date - Date the Ratings Were Computed (Old BMS Item PC08)

#### Description:

This required item is used to record the date that the inventory and operating ratings in items SL26 and SL27 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**

(Old BMS Item PB03)

**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**

(Old BMS Item PB03)

**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**

(Old BMS Item PB04)

**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**

(Old BMS Item PB04)

### **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 Norm - Positive Moment Comparison Factor (Normal Traffic)**

(Old BMS Item PB05)

### **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 Factor Rest - Positive Moment Comparison Factor Comment (Restricted Traffic)**

(Old BMS Item PB05)

### **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)**

(Old BMS Item PB06)

**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)**

(Old BMS Item PB06)

**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.

**Procedure:**

CMCFC(-) of span when restrictions (load conditions - see Item SL10) are placed on the permit vehicle.

**SL10 Load Condition - Load Conditions for the Permit**

(Old BMS Item PB07)

**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**

(Old BMS Item PA11)

**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)**

(Old BMS Item PC12)

**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**

(Old BMS Item PC13)

**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)**

(Old BMS Item PC14)

### **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**

(Old BMS Item PC15)

### **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 Rating Notes**

(Old BMS Item PC11)

### **Description:**

This item is used to record any notes or comments.

### **Procedure:**

Record any narrative information that is necessary to identify ratings information.

## SL APRAS Span - Load Capacity Details

The APRAS Span - Load Capacity Detail screen is used to enter and display one or more load rating values for the Span/Dataset.

By default, the screen will display all the load rating information for the current Span/Dataset ID. Load rating information for another span may be viewed by selecting the Span/Dataset ID from the dropdown list. The "Create" button allows the addition of new load rating info for a span. After an add operation is performed, the "Save" button must be clicked to save the records in the database. 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.

### **SL17 Control Mem - Controlling Member of the Span**

(Old BMS Item PC03)

#### **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 of the span.

#### **Coding:**

- |   |                                                |   |              |
|---|------------------------------------------------|---|--------------|
| 1 | Beam or Girder (Longitudinal Member)           | 5 | Deck         |
| 2 | Floorbeam (Transverse Member)                  | 6 | Substructure |
| 3 | Hanger                                         | 9 | Other        |
| 4 | Tension Member in a Truss or Similar Structure |   |              |

## **SL18 AASHTO Spec Year 0 Year of Specifications Used In Determining Shear Ratings**

(Old BMS Item PC04)

**Description:**

This item indicates the year of the AASHTO Specifications used for shear ratings.

**Procedure:**

Enter the 4 digit year.

**Example:**

Year 1978 is coded as: **1978**

## **SL19 AASHTO Int Manual Year - Year of Interim Specifications Used In Determining Shear Ratings**

**Description:**

This item indicates the year of the AASHTO Interim Specifications used for shear ratings.

**Procedure:**

Enter the 4 digit year.

## **SL20 Deterioration % - Percent Deterioration of the Controlling Member**

(Old BMS Item PC05)

**Description:**

This item is used to record the percent deterioration for the controlling member of the span.

**Procedure:**

Enter the percent deterioration for the controlling member of the span.

**Coding:**

Percent deterioration.

Range: 0 - 99

## **SL21 Fatigue Cat - Fatigue Stress Category of the Controlling Member/Detail**

(Old BMS Item PC06)

**Description:**

This item is used to record the fatigue category of the controlling structural member of the span.

**Procedure:**

Enter the AASHTO fatigue stress category of the identified controlling structural member. Leave blank if not applicable.

**Coding:**

A, B, B', C, C', D, E, E', and F - Category as determined from structural analysis computations using current AASHTO Standard Specifications for Highway Bridges.

Enter B' and E' as follows:

|   |    |
|---|----|
| K | B' |
| L | E' |

**SL22 Fatigue Stress Range**

(Old BMS Item PC07)

**Description:**

This item is used to record the stress range due to the loading entered in Item SL25 - Load Type.

**Procedure:**

Enter the stress range at inventory stress level due to the load type defined in Item SL25 - Load Type as controlling the fatigue inventory rating.

**Coding:**

The live load stress range in kips per square inch to the nearest tenth. Refer to AASHTO Table 10.3.1A Allowable Fatigue Stress Range.

**SL23 Rating Key No - Rating Sequence Number****Description:**

This display only counter item is used to record the rating sequence number.

**Procedure:**

This item is filled in automatically by the system and required no user input.

**SL24 Load Analysis Method**

(Old BMS Items PC09 and PC10)

**Description:**

This item records the method of analysis used in determining the inventory and operating ratings and the controlling/governing stress.

**Procedure:**

Select the code from the dropdown list that describes the method of analysis used in determining the inventory and operating rating.

**Coding:**

- A Bridge Analysis and Rating (BAR-7)
- B Prestressed Concrete Girder (PS3)
- C Box Culvert (BOX5)
- D LRFD Steel Girder Design and Rating (STLRFD)
- E LRFD Prestressed Concrete Girder Design and Rating (PSLRFD)
- F LRFD Box Culvert Design and Rating (BXLRFD)
- G-V Reserved
- W Bridge capacity based on engineering judgment
- X Bridge capacity based on engineering computations or other software
- Y Other

**SL25 Load Type****Description:**

This item is used to record the type of loading that controls the fatigue inventory rating.

**Procedure:**

Select the type of loading that controls the fatigue inventory rating from the dropdown list.

**Coding:**

- 1 H Loading
- 2 HS Loading
- 3 ML80
- 4 P82
- 5 TK527
- 6 Other
- 7 NBI Load Rating

**SL26 Load Inventory Rate - Inventory Rating Load**

(Old BMS Item PC09)

**Description:**

This item is used to record the inventory rating, in tons, rounded to the nearest ton, for the specified loading.

**Coding:**

Inventory rating in tons, rounded to the nearest ton.

**SL27 Load Operating Rate - Operating Rating Load**

(Old BMS Item PC10)

**Description:**

This item is used to record the operating rating, in tons, rounded to the nearest ton, for the specified loading.

**Coding:**

Operating rating in tons, rounded to the nearest ton.

## 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<br>Span Id<br>Suffix | SC02<br>RMS<br>Route    | SC03<br>On /<br>Under Desc | On/Under |
|---------------------------|-------------------------|----------------------------|----------|
| 01ZC                      | 0022 0050 1171 US 22 EB | 2 - One Route Under        | 2        |

**Permit**      **Clearance Details**

**01ZC      0022 0050 1171 US 22 EB      SC03 Permit Condition**

| On/Loading                       | On Clearance                     | Under/Clearance                  |
|----------------------------------|----------------------------------|----------------------------------|
| <input type="button" value="1"/> | <input type="button" value="2"/> | <input type="button" value="3"/> |

**Permit Condition Desc**

1  
2  
3  
4

## SC01 Span ID Suffix

### 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

(Old BMS Item PB08)

### 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

(Old BMS Item PB12)

### 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**

(Old BMS Item PB14)

**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.

This page intentionally left blank

## 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.

**PennDOT BMS2 Apras Span Data Applet**

Sign/Light: 22002200501171

Metric English

| Span   Apras Span   Load Capacity   Load Capacity Details   Clearance |                         |                            |          |
|-----------------------------------------------------------------------|-------------------------|----------------------------|----------|
| SC01<br>Span Id<br>Suffix                                             | SC02<br>RMS<br>Route    | SC03<br>On /<br>Under Desc | On/Under |
| 01ZC                                                                  | 0022 0050 1171 US 22 EB | 2 - One Route Under        | 2        |
|                                                                       |                         |                            |          |

**Create** **Remove**

Permit

|                             |                                       |                                                                    |
|-----------------------------|---------------------------------------|--------------------------------------------------------------------|
| SC05 Non Res Vert Clear:    | <input type="text" value="16.75 ft"/> | SC06 Non Res Review: <input type="checkbox"/>                      |
| SC07 Min Travel Width Left: | <input type="text" value="0.00 ft"/>  | SC08 Min Travel Width Right: <input type="text" value="36.00 ft"/> |
|                             |                                       |                                                                    |

| Clearance<br>Seq No | SC09<br>Horizontal<br>Distance | SC10<br>Vertical<br>Clearance | Create |  |
|---------------------|--------------------------------|-------------------------------|--------|--|
|                     | ft                             | ft                            |        |  |
|                     |                                |                               |        |  |

## SC05 Non Res Vert Clear - Non-Restricted Vertical Clearance

(Old BMS Item PB10)

### 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          |
| $\leq$ 13.75'       | Pass          |

- B) Evaluated without the 0.25' (3") safety tolerance (Item SC04 is checked).

| <u>Truck Height</u>        | <u>Result</u> |
|----------------------------|---------------|
| > 14.00'                   | Fail          |
| $\leq$ 14.00' and > 13.75' | Manual Review |
| $\leq$ 13.75'              | Pass          |

## SC06 Non Res Review - Non-Restricted Clearance Review Indicator

### 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**

(Old BMS Item PB13)

### **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**

(Old BMS Item PB13)

### **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

(Old BMS Item PB11)

### 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

(Old BMS Item PB11)

### 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.

## 4.0 BMS2 Web

### 4.1. Introduction

The purpose of the BMS2 Web section is to provide a reference to each of the BMS2 Web screens created to provide browser-based access to BMS2 Pontis client application functionality 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 Web screens. As such, this section does not address all of the functional areas of BMS2 outside of the BMS2 Web application.

### 4.2. BMS2 Security and Login

#### 4.2.1 BMS2 Web 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 Web 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 Web 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 Web 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 Web.

#### 4.2.1.1 Business Partner Registration - Non-PennDOT BMS2 Web Users

Before establishing BMS2 Web 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 Web users and/or assign BMS2 Web security groups to existing users.

Please note that non-PennDOT organizations using BMS2 Web 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 Web. For more information about the assignment process, please reference Section 4.7 Assigning Business Partners.

To register as an ECMS/BMS2 Web BP:

1. Navigate to the ECMS website at <http://www.dotdom2.state.pa.us/>
2. Click on Business Partner on the left navigation menu
3. Click on Registration
4. 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 Web users or add BMS2 Web security groups to existing users.

#### 4.2.2 BMS2 Web 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 Web. 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 Web) 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 Web 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 Web users. All PennDOT users of BMS2 Web must have an assigned ECMS userid and password that is distinct from the PENNDOT domain userid and password utilized for security within BMS2 Pontis. In many cases, the userid itself may be identical, but the corresponding password must be maintained separately. Security administration for PennDOT users of BMS2 Web will be provided via the ECMS Help Desk and will not be supported by the BMS2 Pontis Security Administration Console.

##### 4.2.2.1 Business Partner Registration - PennDOT BMS2 Web Users

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

##### 4.2.3 BMS2 Web Security Levels

Within the BMS2 Web application, the “security levels” or user roles defined to help control access to structure inventory and inspection information are basically the same as corresponding security levels utilized within the BMS2Pontis client. 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 Web 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 Web 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 Web. Within BMS2 Web, 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 Web, users with Inspector Supervisor authority have the ability to edit all inspection data available in BMS2 Web, regardless of the corresponding inspection status.
- Owner -This role has full authority within BMS2 Web to perform any action.

##### 4.2.4 BMS2 Web Security Groups

The following is a list of the specific security groups available for PennDOT and Business Partner users within BMS2 Web. These security groups must be linked to a BMS2 Web 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

#### 4.2.5 BMS2 Web Business Partner Assignment

One of the key requirements for BMS2 Web is that external users have access to BMS2 Web 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 Web provides screens and components for Business Partner Assignment as described in Section 4.7. 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 Web. 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 Web – 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 Web 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.

#### 4.2.6 BMS2 Web Application Login

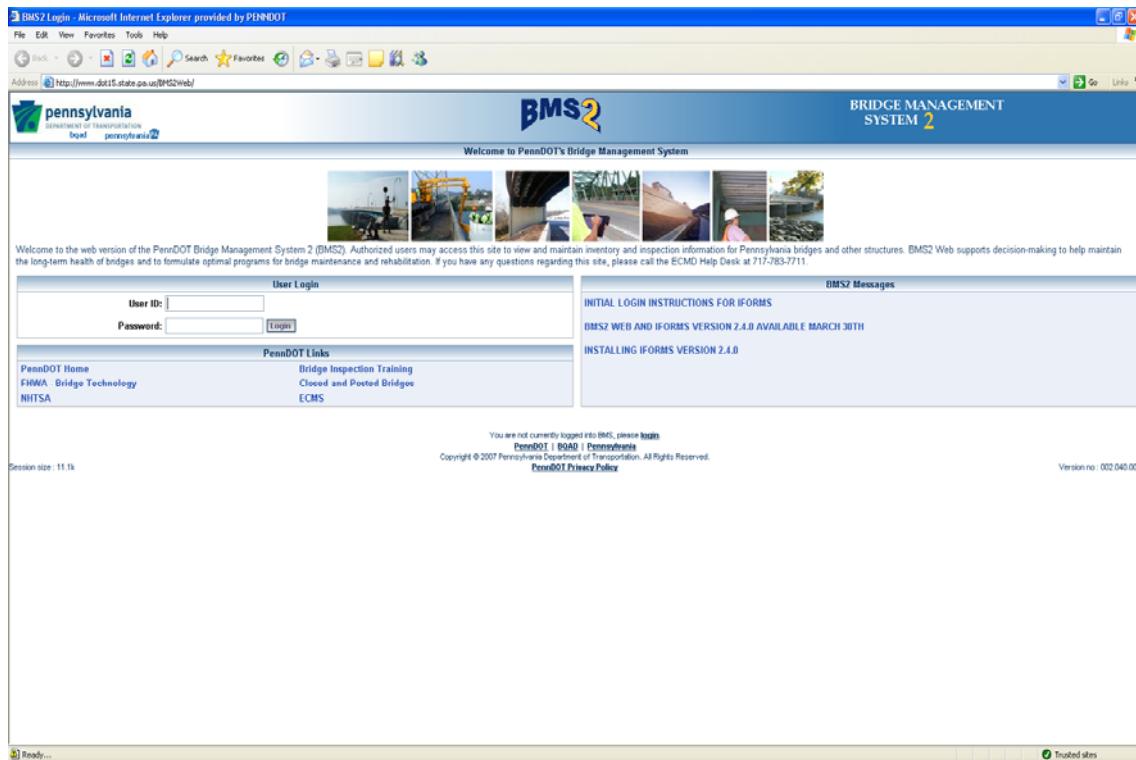
To sign on to the BMS2 Web system, external users will navigate to the following web address:

<http://www.dot14.state.pa.us/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 Web application at the following internal web address:

<http://www.dot15.state.pa.us/BMS2Web/>

Links will also be provided from the internal and external BQAD websites available from dot.state.pa.us and [www.dot.state.pa.us](http://www.dot.state.pa.us), respectively.



**Figure 4.2.6-1 BMS2 Login Screen**

To login to BMS2 Web:

1. Access the BMS2 Web application using either the internal or external address,  
<http://www.dot14.state.pa.us/BMS2Web/> or  
<http://www.dot15.state.pa.us/BMS2Web/>
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 Web.
4. The Structure Search screen is displayed.

### 4.3. System Basics

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

#### 4.3.1 Things You Can't Do In BMS2 Web

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 Web in comparison to other components of BMS2. The following functions cannot be performed directly in BMS2 Web:

- **Create Structures** – PennDOT users must use the Create Structure Applet in BMS2 Pontis client application to create a new structure in BMS2. Non-PennDOT users cannot create structures directly in BMS2.
- **Create Inspections** – Users must use the iForms application to create a new inspection for completion and submission into BMS2.
- **Other Structures** – Inventory and inspection data specific to structures other than bridges and culverts (e.g., signs, retaining walls, noise walls, high-mast lights, etc.) cannot be edited or maintained using BMS2 Web.
- **Project Planning Desktop** – Functionality corresponding to the BMS2 Pontis Project Planning desktop is not provided via BMS2 Web. However, some project planning data may be available using BMS2 Web Crystal Reports.
- **APRAS Data Maintenance** – Detailed APRAS Span data created and maintained within BMS2 for use by the route analysis functionality within APRAS can only be accessed and edited within the BMS2 Pontis APRAS Span Applet.

#### 4.3.2 Field Label Prefixes

The same Field Label Prefixes used to identify fields in the BMS2 Pontis client application are used in the BMS2 Web application as well. 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 Pontis 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.

BMS2 Web does not include a one-for-one screen for each BMS2 Pontis screen. In several cases, BMS2 Web combines information from both BMS2 Pontis Client application and the Applets on one screen. Table 4.3.2-1 is a high-level cross reference of BMS2 Web screens to BMS2 Pontis screens and corresponding label prefixes:

| Web Screen                               | BMS2 Pontis Screen                                                                                                                                                                                                             |
|------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Structure Home                           | 2A - Inspection Notes Card<br>5A - Inspection Inventory - ID/Admin<br>5B - Inspection Inventory - Design<br>5E - Inspection Inventory - Classification                                                                         |
| Agency Bridge                            | 6A - Agency Bridge                                                                                                                                                                                                             |
| Features (and associated Detail screens) | 4A - Inspection Appraisal Card - Other Ratings<br>5C - Inspection Inventory - Roads<br>6C - Agency Roadway<br>FW - Feature Intersected - Waterway<br>FR - Feature Intersected - Railroad<br>FT - Feature Intersected - Utility |

| <b>Web Screen</b>                                                | <b>BMS2 Pontis Screen</b>                                                                                                                               |
|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| Structure Units (and associated Detail screens)                  | 5B - Inspection Inventory - Design<br>5D - Inspection Inventory - Structure Units<br>SP - APRAS Span - Span                                             |
| Design (and associated Detail screens)                           | VD - Inventory - Design                                                                                                                                 |
| Drawing Notes (and associated Detail screens)                    | VN - Inventory - Drawing and Notes                                                                                                                      |
| Inspection Planning (and associated Detail screens)              | VI - Inventory - Inspection Planning                                                                                                                    |
| Posting (and associated Detail screens)                          | VP - Inventory - Posting                                                                                                                                |
| Ratings and Schedule                                             | 1A - Condition Card<br>4A - Inspection Appraisal Card - Other Ratings<br>7A - Inspection Schedule Card<br>IC - Inspection - Comments                    |
| Agency Inspection                                                | 6B - Agency Inspection<br>IC - Inspection - Comments                                                                                                    |
| Element Condition (and associated Detail screens)                | 1A - Condition Card<br>1B - Create / Edit Element Card                                                                                                  |
| Inspection Notes & Comments List (and associated Detail screens) | 2A - Inspection Notes Card<br>IC - Inspection - Comments                                                                                                |
| Load Rating List (and associated Detail screen)                  | 4B - Inspection Appraisal Card - Load Ratings<br>IR - Inspection - Load Rating                                                                          |
| Fracture Critical List (and associated Detail screen)            | 6A - Agency Bridge<br>7A - Inspection Schedule Card<br>IF - Inspection - Fracture Critical                                                              |
| Underwater (and associated Detail screens)                       | 7A - Inspection Schedule Card<br>IU - Inspection - Underwater / OSA<br>IN - Inspection - Underwater / Sub Units<br>IL - Inspection - Underwater / Other |
| Proposed Maintenance (and associated Detail screens)             | IM - Inspection - Maintenance (Proposed)                                                                                                                |
| Completed Maintenance (and associated Detail screens)            | IM - Inspection - Maintenance (Completed)                                                                                                               |

**Table 4.3.2-1 BMS2 Web Screens vs. BMS2 Pontis Screens**

#### 4.3.3 Common Functions and Navigation

BMS2 Web 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 Web.

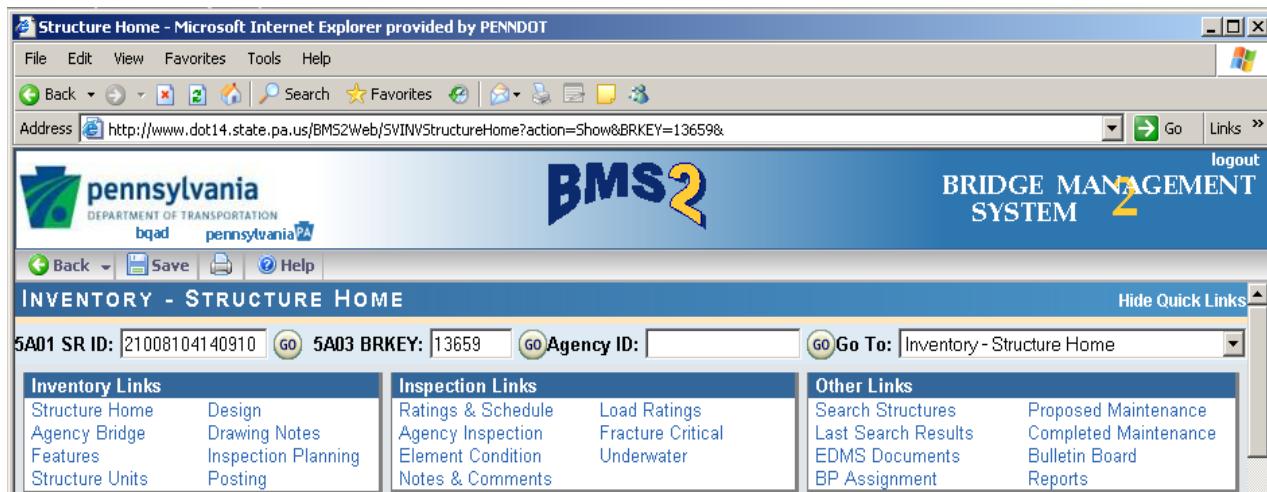


Figure 4.3.3-1 BMS2 Navigation Header

One major difference between BMS2 Web and the BMS2 Pontis client screens is that web screens are typically not sensitive to unsaved changes. Therefore, when the user is in Edit mode and modifies data on the screen, if 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.

##### 4.3.3.1 Header and Footer Links

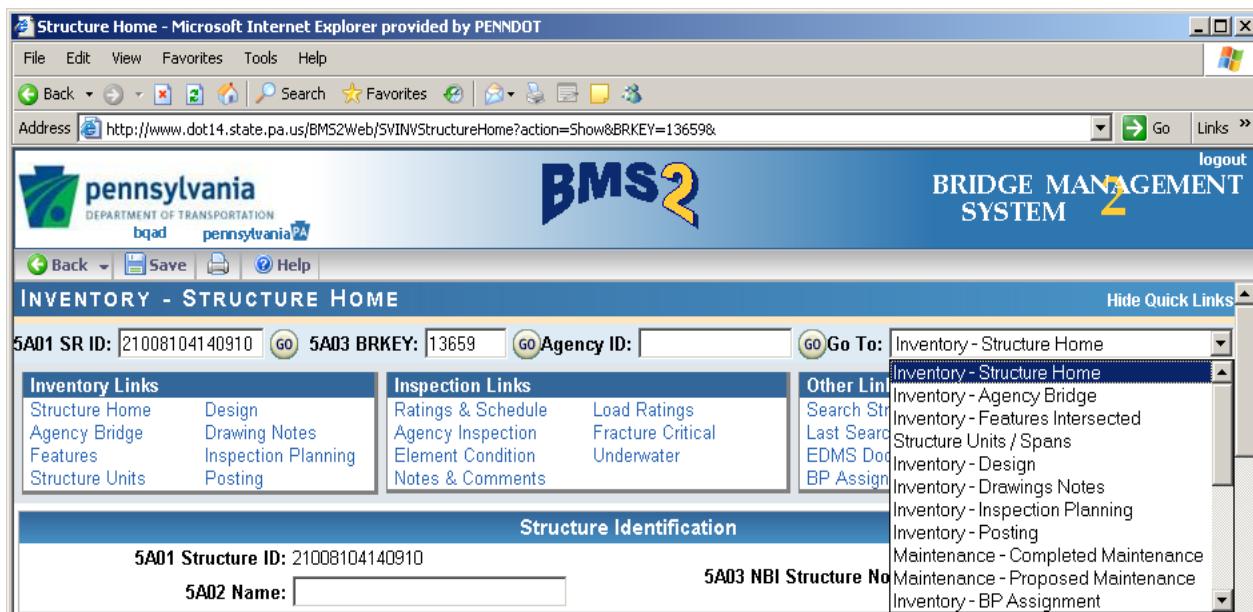
The common header and footer contain several static links that allow the user to navigate to other systems outside of BMS2 Web and/or to return to the BMS2 Web login screen. Specifically, the following static links are included in the header and footer for each BMS2 Web screen:

- Common Header Links
  - Pennsylvania – Takes user to the Commonwealth of Pennsylvania web page ([www.state.pa.us](http://www.state.pa.us)).
  - BQAD – Takes user to Bureau of Design web page
  - Logout – Returns users to the BMS2 Web login screen.
- Common Footer Links
  - PennDOT – Takes user to the external PennDOT home page ([www.dot.state.pa.us](http://www.dot.state.pa.us)).
  - BQAD – Takes user to Bureau of Design web page
  - Pennsylvania – Takes user to the Commonwealth of Pennsylvania web page ([www.state.pa.us](http://www.state.pa.us)).

##### 4.3.3.2 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 Web screens to which the user can navigate to or from the current screen.



**Figure 4.3.3.2-1 Header “Go” Buttons**

When a BMS2 Web 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 Web 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.

#### 4.3.3.3 Quick Links

On most BMS2 Web screens the common header includes static links to every other BMS2 Web 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, 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.

#### 4.3.3.4 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 Web 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.

#### 4.3.3.5 Single Entry Fields

Within the BMS2 Pontis client application there are several standard Pontis fields that can be updated in both Pontis and on a PennDOT-specific applet screen and/or are automatically filled in based upon an entry in a PennDOT-specific field. In general, BMS2 Web screens do not allow editing for any Pontis fields that are being filled in automatically based upon user entry in a PennDOT-specific field. For example, the Load Rating fields on the Pontis Appraisal – Load Rating (4B) tab, the FHWA Structure Type fields (5B12/13 and 5B15/16). In some cases, these fields are not displayed at all in BMS2 Web. The following exceptions were noted in the BMS2 Web design specifications – these fields are display-only on the corresponding BMS2 Web screens: FHWA Structure Type, Posting Status (OPPOSTCL), Roadway fields.

#### 4.3.3.6 Required Entry Fields

There are few required fields within BMS2. However, the BMS2 Pontis client application does not provide a means to identify required fields on the displayed screen – an error message is displayed when a user attempts to leave a required field empty after clicking the Save button. In BMS2 Web, all required fields are distinguished with a yellow field background and a yellow flag icon displayed to the right of the entry field itself:

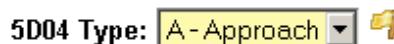


Figure 4.3.3.6-1 A Required Entry Field

#### 4.3.4 Structure Search

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

4.3.4-1 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.

#### **4.3.4.1 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.

#### **4.3.5 Structure List**

BMS2 Web 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.

| BRKEY | SR ID          | Structure Name            | Structure Type | Service Type | Structure Length (ft) | Feature Intersected      | Last Inspection |
|-------|----------------|---------------------------|----------------|--------------|-----------------------|--------------------------|-----------------|
| 2     | 01001500300000 | 1.25 M. N. MARYLAND LINE  | 42204          | 15           | 103                   | MIDDLE CREEK             | 02/05/2007      |
| 3     | 01001500310000 | 1.25 MI. N. OF MD.LINE    | 42206          | 15           | 101                   | MIDDLE CREEK             | 02/06/2007      |
| 4     | 01001500500000 | 2 MI N OF MARYLAND LINE   | 42406          | 15           | 149                   | MARSH CREEK              | 03/08/2007      |
| 5     | 01001500510000 | 2 MI. N. OF MARYLAND LINE | 42204          | 15           | 150                   | MARSH CREEK              | 03/08/2007      |
| 6     | 01001500700986 | 3.5 MI. N. MARYLAND LINE  | 21931          | 15           | 16                    | TRIB MARSH CREEK         | 03/07/2007      |
| 7     | 01001501001849 | S OF GETTYSBURG           | 21932          | 15           | 22                    | PLUM RUN                 | 03/20/2007      |
| 9     | 01001501302809 | 2.5 MI S OF GETTYSBURG    | 31931          | 15           | 11                    | TRIB TO ROCK CREEK       | 04/05/2007      |
| 11    | 01001501312646 | 2.5 MI S. OF GETTYSBURG   | 21932          | 15           | 11                    | TRIB ROCK CREEK          | 04/05/2007      |
| 12    | 01001501500000 | SOUTH OF GETTYSBURG       | 42406          | 15           | 156                   | ROCK CREEK               | 04/05/2007      |
| 13    | 01001501510000 | S OF GETTYSBURG           | 42204          | 15           | 154                   | ROCK CREEK               | 04/03/2007      |
| 14    | 01001501900000 | US15 & PA 116 INTERCHANGE | 42206          | 11           | 43                    | PA 116; SR 0116          | 04/12/2007      |
| 15    | 01001501910000 | 2 MI. E. OF GETTYSBURG    | 42206          | 61           | 43                    | PA 116, SR 0116          | 04/12/2007      |
| 16    | 01001502100000 | 2 MILES S. OF GETTYSBURG  | 31931          | 15           | 12                    | BRANCH OF ROCK CREEK     | 04/12/2007      |
| 17    | 01001502110000 | 2 MI. S. OF GETTYSBURG    | 21931          | 15           | 14                    | TRIB TO ROCK CREEK       | 04/12/2007      |
| 18    | 01001502300000 | 2 MI. N. OF GETTYSBURG    | 42204          | 12           | 92                    | CSX; WESTERN MARYLAND RR | 04/26/2007      |
| 19    | 01001502310000 | 2 MI. N.E. GETTYSBURG     | 42207          | 12           | 89                    | CSX; WESTERN MARYLAND RR | 04/26/2007      |
| 20    | 01001502403671 | NE OF GETTYSBURG          | 21932          | 15           | 23                    | BRANCH ROCK CREEK        | 05/09/2007      |
| 21    | 01001502503319 | 1 1/2 MI. S. HUNTERSTOWN  | 21932          | 15           | 16                    | TRIB ROCK CREEK          | 05/09/2007      |

**Figure 4.3.5-1 Structure List**

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

1. Click on the BRKEY number link in the first 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).

## 4.4. Inventory Screens

### 4.4.1 Structure Home

The Structure Home screen serves as the “home page” for a structure. Similar to the Inspection Desktop within BMS2 Pontis, 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 Pontis NBI structure inventory information.

This screen presents structure inventory information from the BMS2 Pontis Inventory ID/Admin, Design and Classification tabs. This screen also displays the structure-level Notes field from the Pontis Notes tab.

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

**Structure Home - Microsoft Internet Explorer provided by PENNDOT**

File Edit View Favorites Tools Help

Address <http://www.dot14.state.pa.us/BMS2Web/SVINVStructureHome?action=SHOW&BRKEY=13659>

**BMS2** BRIDGE MANAGEMENT SYSTEM

**INVENTORY - STRUCTURE HOME**

5A01 SR ID: 21008104140910    5A03 BRKEY: 13659    Agency ID:    Go To: Inventory - Structure Home

**Inventory Links**

- Structure Home
- Design
- Agency Bridge
- Drawing Notes
- Features
- Inspection Planning
- Structure Units
- Posting

**Inspection Links**

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

**Other Links**

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

**Structure Identification**

5A01 Structure ID: 21008104140910    5A03 NBI Structure No: 13659

5A02 Name: [ ]

**Location**

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: [ ]

5A14 FIPS Region: [ ]

**Age and Service**

5A15 Year Built: [ ]

5A16 Year Reconstruct: [ ]

5A17 Type of Service On: [ ]

5A18 Under: [ ]

5A19 Num Lanes Under: [ ]

**Management**

5A20 Maint Resp: [ ]

5A21 Owner: [ ]

5A23 Agency Admin Area: [ ]

**Deck Information**

5B02 Deck Surface Type: [ ]

5B03 Deck Membrane Type: [ ]

**Span Information**

5B11 Number of Main Spans: [ ]

5B12 Main Span Material: [ ]

5B13 Main Span Design: [ ]

Figure 4.4.1-1 Structure Home Screen

#### 4.4.2 Agency Bridge

The Agency Bridge screen is used to view and maintain structure inventory information from the BMS2 Pontis Inspection Desktop - 6 Agency / Bridge tab. These fields are PennDOT-specific inventory fields that were added to Pontis.

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 4.4.2-1 Agency Bridge Screen

#### 4.4.3 Features Intersected

##### 4.4.3.1 Features Intersected List

The Features Intersected List screen lists all of the intersecting features – roadways, waterways, railroads and utilities – for a specific structure. Unlike the BMS2 Pontis client application, in which Roadways are displayed using standard Pontis screens/tabs and the Features Intersected applet only displays non-roadway features, this screen combines the display of roadway and non-roadway features in a single list. As such, it is conceptually similar to the scrolling area at the top of the BMS2 Pontis Inspection Desktop - 4 Inventory / Roads tab.

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.

**Feature Intersected - Microsoft Internet Explorer provided by PENNDOT**

File Edit View Favorites Tools Help

Back Search Favorites Go Links

Address http://www.dot14.state.pa.us/BMS2Web/SVINVList?action=SHOW&BRKEY=13659

**pennsylvania** DEPARTMENT OF TRANSPORTATION bquad pennsylvaniaPA **BMS2** BRIDGE MANAGEMENT SYSTEM

**INVENTORY - FEATURES INTERSECTED** Hide Quick Links

5A01 SR ID: 21008104140910 | Go 5A03 BRKEY: 13659 | Go Agency ID: [ ] | Go Go To: Inventory - Features Intersected

| Inventory Links |                     | Inspection Links   |                   | Other Links         |                       |
|-----------------|---------------------|--------------------|-------------------|---------------------|-----------------------|
| Structure Home  | Design              | Ratings & Schedule | Load Ratings      | Search Structures   | Proposed Maintenance  |
| Agency Bridge   | Drawing Notes       | Agency Inspection  | Fracture Critical | Last Search Results | Completed Maintenance |
| Features        | Inspection Planning | Element Condition  | Underwater        | EDMS Documents      | Bulletin Board        |
| Structure Units | Posting             | Notes & Comments   |                   | BP Assignment       | Reports               |

**Roadway** +

| 5C01 Route Name | 5C03On_Under | 5C04/5C06 Rte Pref/Route#/Suf | 6C01-6C04 State Route | 5C10 ADT | 5C22 Functional Class | Action |
|-----------------|--------------|-------------------------------|-----------------------|----------|-----------------------|--------|
|                 |              |                               |                       |          |                       |        |
|                 |              |                               |                       |          |                       |        |

**Waterway** +

**Railroad** +

**Utility** +

You are currently logged in as **mahefeli**. Your session will timeout in **30** minutes.  
[PennDOT](#) | [BQAD](#) | [Pennsylvania](#)  
 Copyright © 2007 Pennsylvania Department of Transportation. All Rights Reserved.  
[PennDOT Privacy Policy](#)  
 Session size : 57.2k Version no : 002.020.000 Unknown Zone (Mixed)

Figure 4.4.3.1-1 Features Intersected List

#### 4.4.3.2 Roadway Detail

The Roadway Detail screen allows users to view and maintain detail information about a specific roadway associated with a structure. The fields on this screen are the combined fields from the BMS2 Pontis Inventory / Roads and Agency Roads tabs.

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.

**Roadway Detail - Microsoft Internet Explorer provided by PENNDOT**

File Edit View Favorites Tools Help

Back Search Favorites Go Links >

Address: http://www.dot14.state.pa.us/BMS2Web/SVINWRoadway?action>Show&BRKEY=13659&ON\_UNDER=1

**pennsylvania DEPARTMENT OF TRANSPORTATION** **BMS2** **BRIDGE MANAGEMENT SYSTEM**

**INVENTORY - FEATURES INTERSECTED**

5A01 SR ID: 21008104140910 | 5A03 BRKEY: 13659 | Agency ID: | Go To: Inventory - Features Intersected

|                                                                |                                                           |                                                                                  |                                                 |                                                                             |                                                                            |
|----------------------------------------------------------------|-----------------------------------------------------------|----------------------------------------------------------------------------------|-------------------------------------------------|-----------------------------------------------------------------------------|----------------------------------------------------------------------------|
| <b>Inventory Links</b>                                         | <b>Inspection Links</b>                                   | <b>Other Links</b>                                                               |                                                 |                                                                             |                                                                            |
| Structure Home<br>Agency Bridge<br>Features<br>Structure Units | Design<br>Drawing Notes<br>Inspection Planning<br>Posting | Ratings & Schedule<br>Agency Inspection<br>Element Condition<br>Notes & Comments | Load Ratings<br>Fracture Critical<br>Underwater | Search Structures<br>Last Search Results<br>EDMS Documents<br>BP Assignment | Proposed Maintenance<br>Completed Maintenance<br>Bulletin Board<br>Reports |

**Roadway Identification**

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: [ ] 5C16 Speed: [ ] mph

5C07 Critical Facility: [ ] 5C15 Detour Length: [ ] mi 5C17 ADTT: [ ] 6C28 ADTT Year: [ ]

**Traffic**

**Highway Networks and Service Classifications**

5C18 Mile Pt: [ ] mi 5C26 Appr.Road: [ ] ft 5C27 Roadway: [ ] ft

5C19 Nat Base Net: [ ] 5C28 Defense Hwy: [ ] Unknown Zone (Mixed)

**Width**

**Alternate Classifications**

Figure 4.4.3.2-1 Roadway Detail Screen

#### 4.4.3.3 Waterway Detail

The Waterway Detail screen allows users to view and maintain detail information about a specific waterway associated with a structure. The fields on this screen are from the BMS2 Pontis Features Intersected Applet - Waterway tab.

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 displays the 'Waterway Detail' page within a Microsoft Internet Explorer browser window. The title bar reads 'Waterway Detail - Microsoft Internet Explorer provided by PENNDOT'. The address bar shows the URL: <http://www.dot14.state.pa.us/BMS2Web/SVINWWaterway?action=Create&BRKEY=13659>. The page header includes the Pennsylvania Department of Transportation logo, the BMS2 logo, and a 'BRIDGE MANAGEMENT SYSTEM' link. The main content area is titled 'INVENTORY - FEATURES INTERSECTED'. It features several search and navigation fields: '5A01 SR ID: 21008104140910', '5A03 BRKEY: 13659', 'Agency ID: [ ]', and 'Go To: Inventory - Features Intersected'. Below these are three columns of links: 'Inventory Links' (Structure Home, Agency Bridge, Features, Structure Units), 'Inspection Links' (Design, Drawing Notes, Inspection Planning, Posting, Ratings & Schedule, Agency Inspection, Element Condition, Notes & Comments), and 'Other Links' (Load Ratings, Fracture Critical, Underwater, Search Structures, Last Search Results, EDMS Documents, BP Assignment, Proposed Maintenance, Completed Maintenance, Bulletin Board Reports). A large section titled 'WATERWAY DETAIL' contains numerous input fields and dropdown menus. These include: '5C03 On/Under:' dropdown, '4A21 Nav Control Exists:' dropdown, '4A22 Nav Vertical Clr: ft', '4A23 Nav Horizontal Clr: ft', '4A24 Min Vert Lft Clr: ft'; 'Waterway' section with fields: 'FW01 Stream Name:' dropdown, 'FW02 Stream Classification 1: (blank)' dropdown, 'FW03 Stream Classification 2: (blank)' dropdown, 'FW04 Timeframe:' dropdown, 'FW05 Stream Classification 3: (blank)' dropdown, 'FW06 Permit Type:' dropdown, 'FW07 Drainage Area:' dropdown, 'FW08 Fishable:' checkbox, 'FW09 Waterflow Direction:' dropdown, 'FW10 Primary Waterway:' checkbox, 'FW11 Vertical Clearance:' dropdown, 'FW12 Max W.S. Elevation:' dropdown, 'FW13 Max W.S. Elevation Year:' dropdown; and a 'Done' button at the bottom left and a 'Trusted sites' checkbox at the bottom right.

Figure 4.4.3.3-1 Waterway Detail Screen

#### 4.4.3.4 Railroad Detail

The Railroad Detail screen allows users to view and maintain detail information about a specific railroad associated with a structure. The fields on this screen are from the BMS2 Pontis Features Intersected Applet - Railroad tab.

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.

Figure 4.4.3.4-1 Railroad Detail Screen

#### 4.4.3.5 Utility Detail

The Utility Detail screen is to allow users to view and maintain detail information about a specific utility associated with a structure. The fields on this screen are from the BMS2 Pontis Features Intersected Applet - Utility tab.

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 4.4.3.5-1 Utility Detail Screen

#### 4.4.4 Structure Units

##### 4.4.4.1 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.

**The structure unit list does not include APRAS Span structure units if any exist for the structure. APRAS Span structure units cannot be maintained through BMS2 Web – they can only be maintained using the BMS2 Pontis APRAS Span Applet.**

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

The screenshot shows the BMS2 Web interface for managing bridge structure units. At the top, there's a navigation bar with links for File, Edit, View, Favorites, Tools, Help, Back, Forward, Home, Search, Favorites, and a search bar. Below the navigation is the Pennsylvania Department of Transportation logo and the BMS2 logo. The main title is "STRUCTURE UNITS / SPANS". The page displays a table with the following data:

| SD01 Unit Key | SP01 Type | SP02 Unit ID | SP03 Span Length | Action |
|---------------|-----------|--------------|------------------|--------|
|               |           |              |                  |        |
|               |           |              |                  |        |
|               |           |              |                  |        |
|               |           |              |                  |        |

Below the table, there are sections for "Number of Spans", "Records 1 to 4 of 4", "Records Per Page: 5", and "Action". At the bottom, there are session information (Session size: 69.5k), copyright information (PennDOT | BQAD | Pennsylvania, Copyright © 2007 Pennsylvania Department of Transportation. All Rights Reserved., PennDOT Privacy Policy), and a version number (Version no: 002.020.000).

Figure 4.4.4.1-1 Structure Unit / Span List Screen

#### 4.4.4.2 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.

This screen displays structure unit detail information from the fields displayed on the BMS2 Pontis Inventory / Structure Units tab and the BMS2 Pontis APRAS Span applet – Span tab. 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.**

The screenshot shows the 'Structure Unit Detail' page of the BMS2 web application. At the top, there's a header bar with the PennDOT logo, the 'BMS2' logo, and a 'BRIDGE MANAGEMENT SYSTEM' link. Below the header, there's a toolbar with buttons for Back, New, Save, Save & Exit, Delete, Next, and Help. The main content area has several sections:

- STRUCTURE UNITS / SPANS**: A section with input fields for 'SA01 SR ID' (21008104140910), 'SA03 BRKEY' (13659), 'Agency ID' (empty), and a 'Go To' dropdown set to 'Structure Units / Spans'.
- Inventory Links**: Includes links to 'Structure Home', 'Agency Bridge', 'Features', and 'Structure Units'. It also lists 'Design', 'Drawing Notes', 'Inspection Planning', and 'Posting' under 'Design'.
- Inspection Links**: Includes 'Ratings & Schedule', 'Agency Inspection', 'Element Condition', and 'Notes & Comments'.
- Other Links**: Includes 'Search Structures', 'Last Search Results', 'EDMS Documents', 'BP Assignment', 'Proposed Maintenance', 'Completed Maintenance', 'Bulletin Board', and 'Reports'.
- STRUCTURE UNIT / SPAN DETAIL**: This is the active section. It contains fields for '5D01 Unit Key', '5D02 Unit ID' (empty), '5D04 Type' (dropdown menu), '5D05 Default Bridge Unit' (checkbox), and '5D03 Structure Unit Description' (large text area).
- Span Specific Information**: Fields for 'SP03 Span Length' (ft), 'SP04 Span Deck Width' (ft), 'SP05 Span Flared' (checkbox), 'SP07 Dept Material Type' (dropdown), 'SP08 Dept Physical Type' (dropdown), 'SP09 Dept Span Inter' (dropdown), and 'SP10 Dept Struc Config' (dropdown).
- Notes**: A large text area for notes.

At the bottom, there are footer links for 'PennDOT | BQAD | Pennsylvania', 'Copyright © 2007 Pennsylvania Department of Transportation. All Rights Reserved.', 'PennDOT Privacy Policy', and 'Session size : 78.3k'. On the right side, it says 'Version no : 002.020.000'. The status bar at the bottom right includes 'Trusted sites' and other icons.

Figure 4.4.4.2-1 Structure Unit / Span Detail Screen

#### 4.4.5 Design

##### 4.4.5.1 Design Information and Lists

The Design screen allows users to view and maintain design-related information for a structure. The information on this screen matches the BMS2 Pontis Inventory Applet Design tab.

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 'Design' interface of the BMS2 Web application. At the top, there's a navigation bar with links for 'File', 'Edit', 'View', 'Favorites', 'Tools', and 'Help'. Below the navigation bar is a toolbar with icons for 'Back', 'Forward', 'Search', and 'Favorites'. The main content area has a header 'INVENTORY - DESIGN' and a sub-header '5A01 SR ID: 21008104140910 [GO] 5A03 BRKEY: 13659 [GO] Agency ID: [GO] Go To: Inventory - Design'. The page is divided into several sections:

- Inventory Links:** Structure Home, Agency Bridge, Features, Structure Units; Design, Drawing Notes, Inspection Planning, Posting.
- Inspection Links:** Ratings & Schedule, Agency Inspection, Element Condition, Notes & Comments; Load Ratings, Fracture Critical, Underwater.
- Other Links:** Search Structures, Last Search Results, EDMS Documents, BP Assignment; Proposed Maintenance, Completed Maintenance, Bulletin Board, Reports.
- Design Method:** VD01 Design Method: [dropdown menu].
- Live Load Continuity:** VD02 Live Load Continuity: [dropdown menu].
- Geometry:** VD03 Geometry: [dropdown menu].
- Superstructure Steel:** VD04 Steel Beam Splice: [dropdown menu].
- Steel Types:** VD05 Steel Types: [dropdown menu] listing options from 01-A7/Carbon to 08-A514/A517/High Fy.
- Superstructure Concrete:** VD06 Vacuum Process: [dropdown menu].
- Tension Methods:** VD11 Design Tension Methods: [dropdown menu] showing three options.
- Strand Type:** VD07 Strand Type: [dropdown menu].
- Compaction Strength:** VD08 Comp Strength @ 28 days: [text input] PSI.
- Release Compaction Strength:** VD09 Comp Strength @ Release: [text input] PSI.
- Prestressed Splice Type:** VD10 Prestressed Splice Type: [dropdown menu] with sub-options for Design, Filler, and Through.
- Other Fields:** VD12 Material Type: [dropdown menu], VD13 Splice Type: [dropdown menu].

Figure 4.4.5.1-1 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.

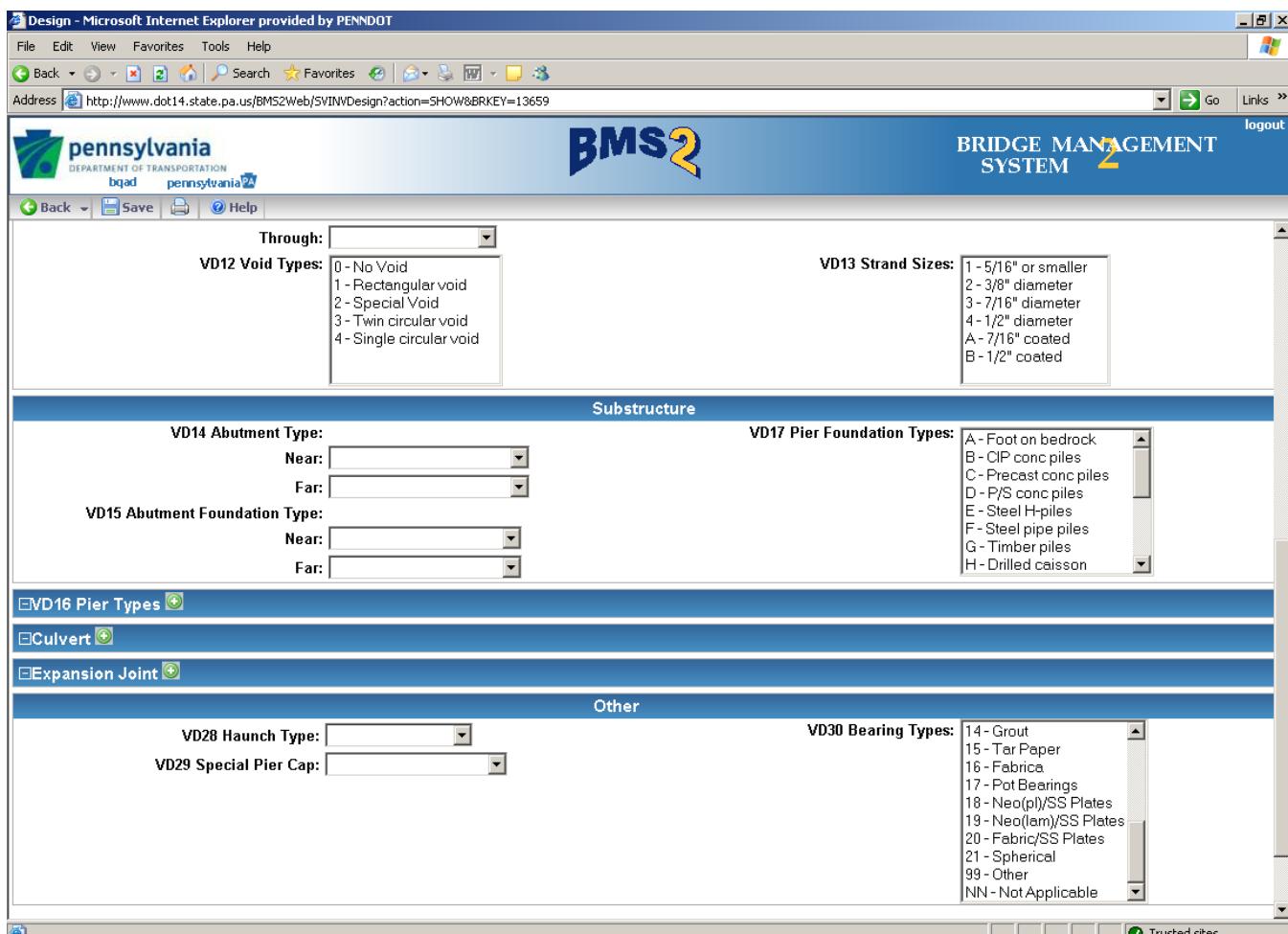


Figure 4.4.5.1-2 Inventory Design Screen – Part 2

### 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. Multiple selections in these fields are converted to separate items displayed in the corresponding lists on the BMS2 Pontis Inventory applet – Design tab.
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.

### VD17 Pier Foundation Types

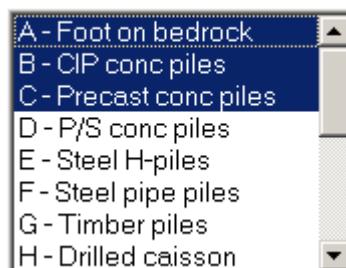


Figure 4.4.5.1-3 A Multi-Select Field

#### 4.4.5.2 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, similar to the pier type data provided by the corresponding fields on the BMS2 Pontis Inventory applet Design tab.

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.

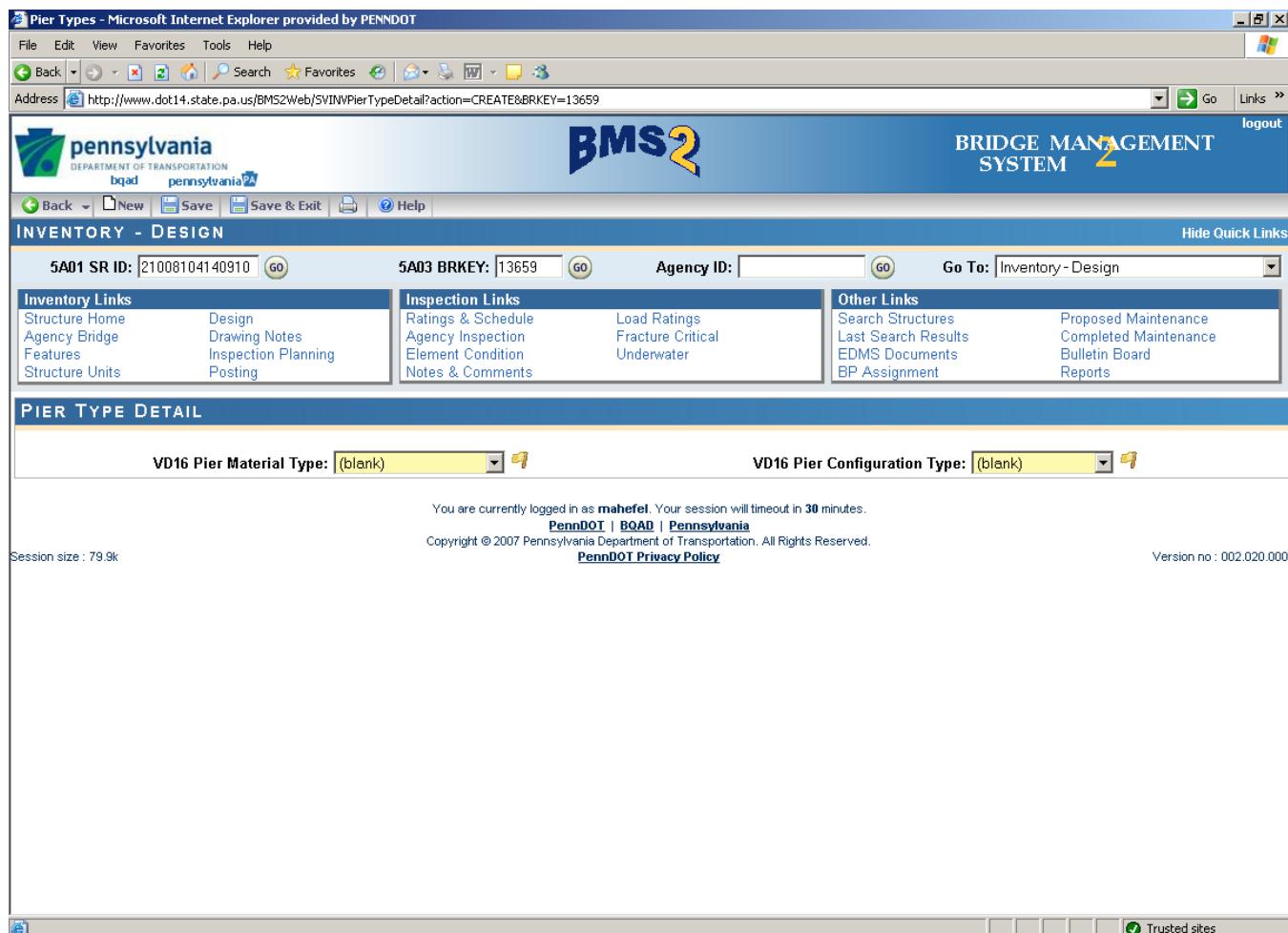


Figure 4.4.5.2-1 Pier Type Detail Screen

#### 4.4.5.3 Design - Culvert Detail

The Culvert Detail screen allows users to view and maintain detailed information about culvert openings associated with the structure, similar to the culvert-related data provided by the corresponding fields on the BMS2 Pontis Inventory Applet - Design tab.

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.

The screenshot shows the 'Design Culvert' page in Microsoft Internet Explorer. The top navigation bar includes File, Edit, View, Favorites, Tools, Help, Back, Forward, Stop, Home, Search, Favorites, Mail, Help, and Links. The address bar shows the URL: http://www.dot14.state.pa.us/BMS2Web/SVINVDesignCulvert?action=CREATE&BRKEY=13659. The main header features the Pennsylvania Department of Transportation logo, the BMS2 logo, and the BRIDGE MANAGEMENT SYSTEM. A 'logout' link is also present. Below the header, there are tabs for Back, New, Save, Save & Exit, and Help. The main content area is titled 'INVENTORY - DESIGN'. It displays several input fields for culvert details: 'SA01 SR ID: 21008104140910' with a 'Go' button; 'SA03 BRKEY: 13659' with a 'Go' button; 'Agency ID: [ ]' with a 'Go' button; and 'Go To: Inventory - Design' with a dropdown arrow. There are four main sections of links: 'Inventory Links' (Structure Home, Agency Bridge, Features, Structure Units), 'Inspection Links' (Design, Drawing Notes, Inspection Planning, Posting, Ratings & Schedule, Agency Inspection, Element Condition, Notes & Comments), 'Load Ratings' (Fracture Critical, Underwater), and 'Other Links' (Search Structures, Last Search Results, EDMS Documents, BP Assignment, Proposed Maintenance, Completed Maintenance, Bulletin Board Reports). The central part of the screen is titled 'CULVERT DETAIL' and contains four input fields: 'VD18 Opening Type: (blank)', 'VD19 Length: [ ] ft', 'VD20 Min Fill Height: [ ] ft', and 'VD21 Max Fill Height: [ ] ft'. To the right, there are two more input fields: 'VD22 Eff Width: [ ] ft' and 'VD23 Tie Type: (blank)'. Below these fields, a message states: 'You are currently logged in as mahefel. Your session will timeout in 30 minutes.' Below that is the PennDOT | BOAD | Pennsylvania logo, copyright information (Copyright © 2007 Pennsylvania Department of Transportation. All Rights Reserved.), a link to 'PennDOT Privacy Policy', and session details ('Session size : 80.7k'). At the bottom right, it says 'Version no : 002.020.000'. The footer includes a 'Done' button and a 'Trusted sites' link.

Figure 4.4.5.3-1 Culvert Detail Screen

#### 4.4.5.4 Design - Expansion Joint Detail

The Expansion Joint Detail screen allows users to view and maintain detailed information about expansion joints associated with a structure, similar to the expansion joint data provided by the corresponding fields on the BMS2 Pontis Inventory Applet - Design tab.

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.

The screenshot shows a Microsoft Internet Explorer window titled "Design Expansion Joint - Microsoft Internet Explorer provided by PENNDOT". The address bar shows the URL: <http://www.dot14.state.pa.us/BMS2Web/SVINVDesignExpansionJoint?action=CREATE&BRKEY=13659>. The page header includes the Pennsylvania Department of Transportation logo, the BMS2 logo, and a "BRIDGE MANAGEMENT SYSTEM" link. The main content area is titled "INVENTORY - DESIGN". It features several input fields: "5A01 SR ID: 21008104140910" with a "Go" button; "5A03 BRKEY: 13659" with a "Go" button; and "Agency ID: [ ]" with a "Go" button. Below these are three groups of links: "Inventory Links" (Structure Home, Agency Bridge, Features, Structure Units), "Inspection Links" (Ratings & Schedule, Agency Inspection, Element Condition, Notes & Comments), and "Other Links" (Search Structures, Last Search Results, EDMS Documents, BP Assignment). A section titled "EXPANSION JOINT" contains dropdown menus for "VD25 Expansion Joint Type: (blank)", "VD26 Movement Class: (blank)", and "VD27 Manufacture Code: (blank)". At the bottom, a message says "You are currently logged in as mahefel. Your session will timeout in 30 minutes." followed by "PennDOT | BQAD | Pennsylvania" and "Copyright © 2007 Pennsylvania Department of Transportation. All Rights Reserved." Session size is listed as "Session size : 81.1k" and version number as "Version no : 002.020.000".

**Figure 4.4.5.4-1 Design - Expansion Joint Detail Screen**

#### 4.4.6 Drawing Notes

##### 4.4.6.1 Drawing General Information and List

The Drawing Notes screen allows users to view and maintain detailed information for drawings and high-level design information similar to that provided by the BMS2 Pontis Inventory applet Drawing Notes tab. 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 lists on the BMS2 Pontis Inventory applet – Drawings Notes tab, 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).

The screenshot shows the 'Drawing Notes' page of the BMS2 Bridge Management System. At the top, there's a header bar with the BMS2 logo and navigation links like 'Logout'. Below the header, there are search fields for 'SR ID' (5A01) and 'BRKEY' (5A03), and a dropdown for 'Agency ID'. The main content area is divided into several sections:

- Inventory Links:** Includes links for Structure Home, Agency Bridge, Features, and Structure Units under 'Design', and Drawing Notes, Inspection Planning, and Posting under 'Drawing Notes'.
- Inspection Links:** Includes Ratings & Schedule, Agency Inspection, Element Condition, and Notes & Comments.
- Other Links:** Includes Search Structures, Last Search Results, EDMS Documents, Proposed Maintenance, Completed Maintenance, Bulletin Board, and BP Assignment Reports.
- VN01 Design Exception Codes:** A list containing 1 - Bridge Width, 2 - Over/Under Clearance, 3 - Live Load, 4 - Any Comb. of Above, and 5 - End Transition.
- VN02 Soil Boring Notes:** A large empty text area.
- VN03 Test Description:** A large empty text area.
- VN04 Storage Location:** A large empty text area.
- VN05-VN07 Drawings:** A table with columns for Drawing Type, Drawing Number, Description, and Action. It includes a header row and a data row.

Figure 4.4.6.1-1 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.

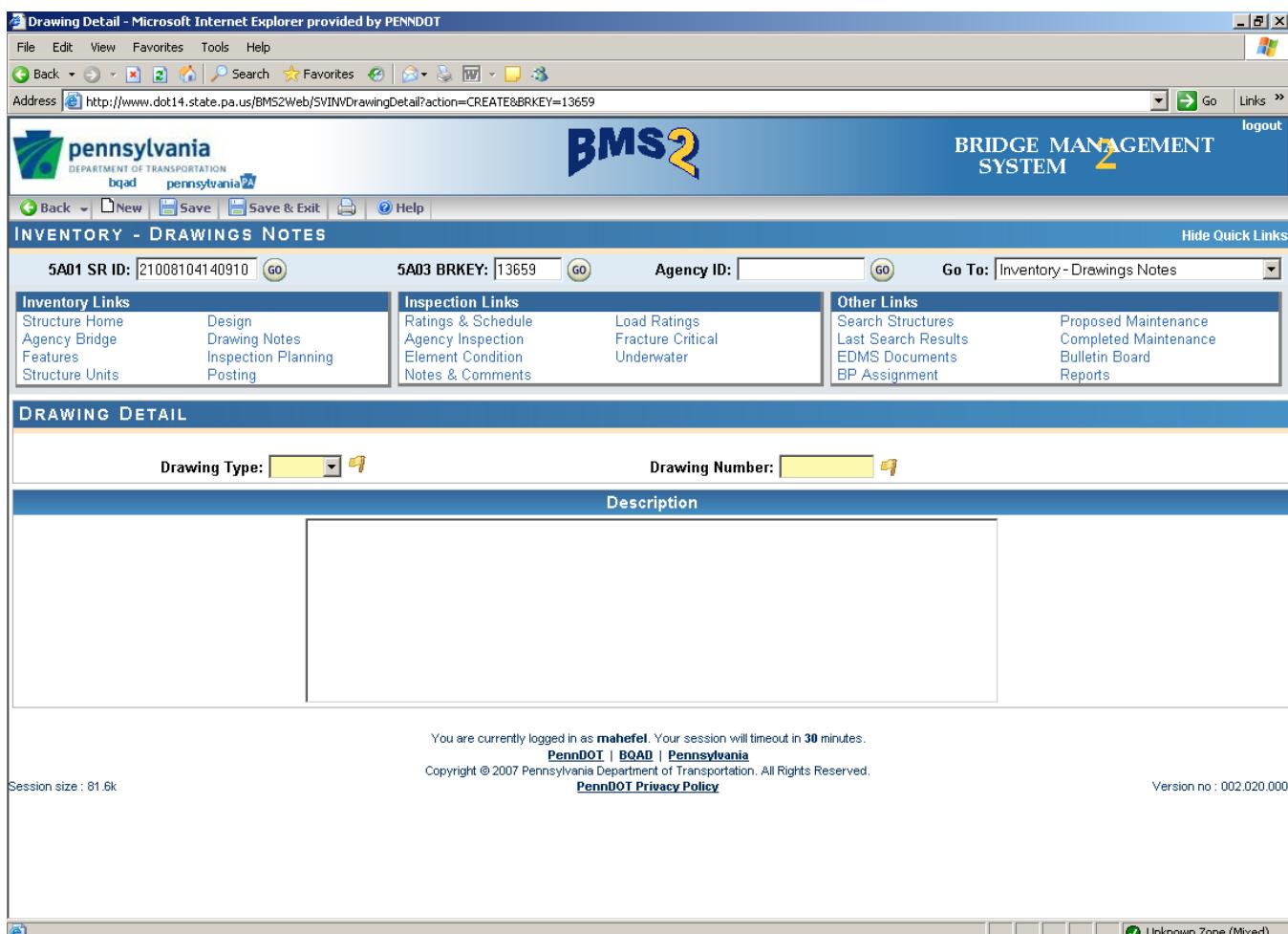
In view mode, each item includes a single View link to access the corresponding Detail screen.

#### 4.4.6.2 Drawing Detail

The Drawing Detail screen allows users to view and maintain detailed information about design, repair and shop drawings for a structure, similar to that provided by the BMS2 Pontis Inventory applet - Drawing & Notes tab.

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 4.4.6.2-1 Drawing Detail Screen**

#### 4.4.7 Inspection Planning

##### 4.4.7.1 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. The information on this screen matches the BMS2 Pontis Inventory applet - Inspection Planning tab. 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. The fields on the Equipment and Permit tab match those of the Equipment and Permit tab of the BMS2 Pontis Inventory applet - Inspection Planning tab, fields VI11 through VI22. 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).

**INVENTORY - INSPECTION PLANNING**

5A01 SR ID: 21008104140910 (60)    5A03 BRKEY: 13659 (60)    Agency ID: \_\_\_\_\_ (60)    Go To: Inventory - Inspection Planning

|                                                                |                                                                                                                                                                                                  |                                                                                                                                                        |
|----------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Inventory Links</b>                                         | <b>Inspection Links</b>                                                                                                                                                                          | <b>Other Links</b>                                                                                                                                     |
| Structure Home<br>Agency Bridge<br>Features<br>Structure Units | Design<br>Drawing Notes<br>Inspection Planning<br>Posting<br>Ratings & Schedule<br>Agency Inspection<br>Element Condition<br>Notes & Comments<br>Load Ratings<br>Fracture Critical<br>Underwater | Search Structures<br>Last Search Results<br>EDMS Documents<br>BP Assignment<br>Proposed Maintenance<br>Completed Maintenance<br>Bulletin Board Reports |

**Miscellaneous**

VI01 Min Crane Reach: \_\_\_\_\_ ft    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): \_\_\_\_\_  
VI09 Horizontal Curve: \_\_\_\_\_    VI10 Vertical Curve: \_\_\_\_\_

**VI11 Inspection Limitations**

**Equipment**

**Permits**

You are currently logged in as mahofal. Your session will timeout in 24 minutes.

Figure 4.4.7.1-1 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.

#### 4.4.7.2 Equipment Detail

The Equipment Detail screen allows users to maintain detail information about equipment used for inspection of the structure. The screen displays information that corresponds to the Equipment Detail subtab of the BMS2 Pontis Inventory applet - Inspection Planning tab.

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.

The screenshot shows the 'Equipment Detail' screen within the BMS2 Pontis Inventory applet. The top navigation bar includes links for File, Edit, View, Favorites, Tools, Help, Back, Search, Favorites, and a menu for the BRIDGE MANAGEMENT SYSTEM. The address bar shows the URL: http://www.dot14.state.pa.us/BMS2Web/SVINVInspPlanningEqpDetail?action=CREATE&BRKEY=13659. The main header features the Pennsylvania Department of Transportation logo and the BMS2 logo. Below the header, there are three tabs: 'INVENTORY - INSPECTION PLANNING' (selected), 'New', 'Save', 'Save & Exit', and 'Help'. On the left, there are 'Inventory Links' for Structure Home, Agency Bridge, Features, and Structure Units, along with 'Design', 'Drawing Notes', 'Inspection Planning', and 'Posting' options. In the center, there are 'Inspection Links' for Ratings & Schedule, Agency Inspection, Element Condition, and Notes & Comments, along with 'Load Ratings', 'Fracture Critical', and 'Underwater' options. On the right, there are 'Other Links' for Search Structures, Last Search Results, EDMS Documents, BP Assignment, Proposed Maintenance, Completed Maintenance, Bulletin Board, and Reports. The main content area is titled 'EQUIPMENT DETAIL' and contains fields for 'Equipment ID' (VI12 Equipment Type: (blank)), 'VI13 Equipment Qty' (input field), 'VI14 Consumable' (checkbox), 'VI15 Assigned To' (input field), and a large 'VI16 Notes' text area. A status bar at the bottom right indicates 'Unknown Zone (Mixed)'.

Figure 4.4.7.2-1 Equipment Detail Screen

#### 4.4.7.3 Permit Detail

The Permit Detail screen allows users to maintain detail information about permits that may be required for inspection of the structure. The screen displays information that corresponds to the Permit Detail subtab of the BMS2 Pontis Inventory applet - Inspection Planning tab.

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 'Permit Detail' screen within the BMS2 web application. At the top, there's a header bar with the Pennsylvania Department of Transportation logo, the BMS2 logo, and navigation links like 'File', 'Edit', 'View', 'Favorites', 'Tools', 'Help', 'Back', 'New', 'Save', 'Save & Exit', 'Help', and 'Logout'. Below the header, the URL is http://www.dot14.state.pa.us/BMS2Web/SVINVInspPermitDetail?action=CREATE&BRKEY=13659. The main content area has tabs for 'INVENTORY - INSPECTION PLANNING' and 'PERMIT DETAIL'. In the 'PERMIT DETAIL' section, there are several input fields: 'VI18 Permit Type: (blank)', 'VI19 Issuing Authority: (blank)', 'VI20 POC: (text box)', 'VI21 Phone: (text box)', 'VI22 Fax: (text box)', and 'VI23 Email: (text box)'. Below these is a large text area labeled 'VI24 Notes' with a scroll bar. At the bottom of the page, there are buttons for 'Done' and 'Trusted sites'.

**Figure 4.4.7.3-1 Permit Detail Screen**

#### 4.4.8 Posting

##### 4.4.8.1 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.

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

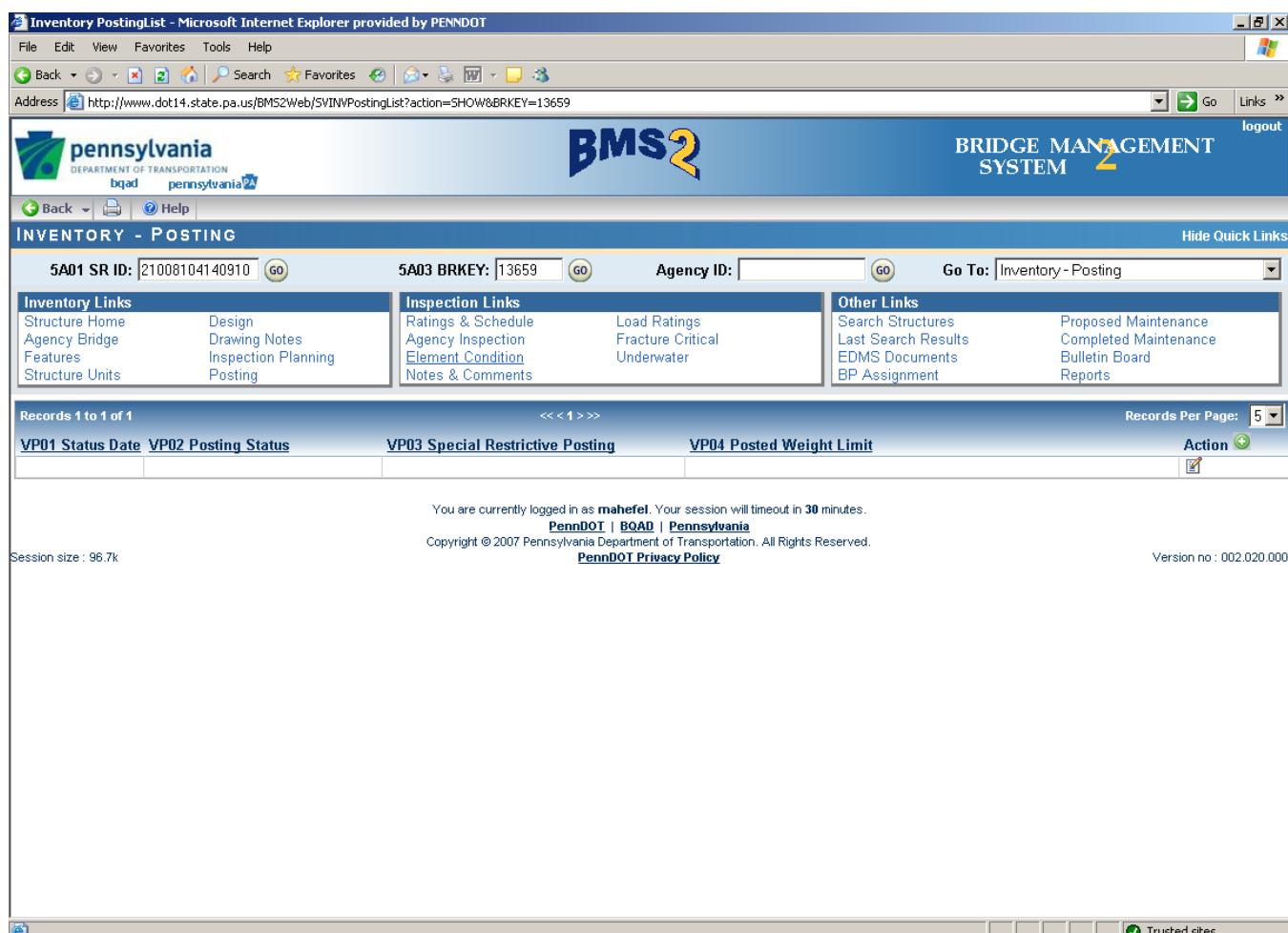


Figure 4.4.8.1-1 Posting Screen

#### 4.4.8.2 Posting Detail

The Posting Detail screen allows users to maintain detail information about posting history of the bridge. The screen displays information that corresponds to the Posting tab of the BMS2 Pontis Inventory applet.

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.

**Posting Detail Screen - Microsoft Internet Explorer provided by PENNDOT**

File Edit View Favorites Tools Help

Back Search Favorites Favorites Home W Go Links >

Address: http://www.dot14.state.pa.us/BMS2Web/SVINVPostingDetail?action=Show&BRKEY=13659&POSTING\_KEY=1

**pennsylvania** DEPARTMENT OF TRANSPORTATION bquad pennsylvania

**BMS2** BRIDGE MANAGEMENT SYSTEM

logout

**INVENTORY - POSTING** Hide Quick Links

5A01 SR ID: 21008104140910 Go! 5A03 BRKEY: 13659 Go! Agency ID: Go! Go To: Inventory - Posting

|                                                                |                                                                                  |                                                                            |
|----------------------------------------------------------------|----------------------------------------------------------------------------------|----------------------------------------------------------------------------|
| <b>Inventory Links</b>                                         | <b>Inspection Links</b>                                                          | <b>Other Links</b>                                                         |
| Structure Home<br>Agency Bridge<br>Features<br>Structure Units | Ratings & Schedule<br>Agency Inspection<br>Element Condition<br>Notes & Comments | Load Ratings<br>Fracture Critical<br>Underwater                            |
| Design<br>Drawing Notes<br>Inspection Planning<br>Posting      |                                                                                  | Proposed Maintenance<br>Completed Maintenance<br>Bulletin Board<br>Reports |

**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:    |                          |

You are currently logged in as **mahefel**. Your session will timeout in **30** minutes.  
[PennDOT](#) | [BQAD](#) | [Pennsylvania](#)  
 Copyright © 2007 Pennsylvania Department of Transportation. All Rights Reserved.  
[PennDOT Privacy Policy](#)

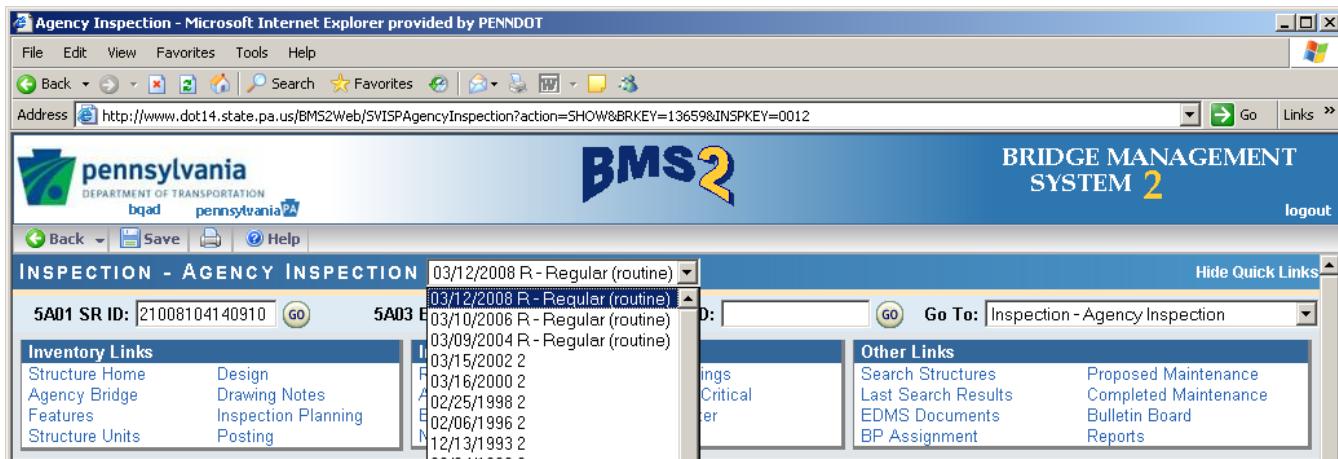
Session size : 93.8k Version no : 002.020.000 Trusted sites

Figure 4.4.8.2-1 Posting Detail Screen

## 4.5. Inspection Screens

### 4.5.1 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, similar to the inspection date dropdown provided on the BMS2 Pontis Inspection Desktop.



**Figure 4.5.1-1 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.

#### 4.5.2 Ratings, Schedule

The purpose of this screen is to allow users to view and maintain basic NBI inspection condition and schedule data for a structure. The data on this screen includes fields from the BMS2 Pontis Condition tab, Appraisal tab and Schedule tab. 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 shows the 'Ratings & Schedule' screen of the BMS2 Web application. At the top, there are navigation links for File, Edit, View, Favorites, Tools, Help, and a search bar. The address bar shows the URL: <http://www.dot14.state.pa.us/BMS2Web/5VISPConditionAppraisal?action=SHOW&BRKEY=13659&INSPKEY=0012>. The main header features the Pennsylvania Department of Transportation logo, the BMS2 logo, and the text 'BRIDGE MANAGEMENT SYSTEM 2'. A 'logout' link is also present.

The main content area is titled 'INSPECTION - RATINGS, SCHEDULE' and shows the date '03/12/2008 R- Regular (routine)'. It contains several groups of input fields:

- Inventory Links:** Includes links for Structure Home, Design; Agency Bridge, Drawing Notes; Features, Inspection Planning; and Structure Units, Posting.
- Inspection Links:** Includes links for Ratings & Schedule, Agency Inspection, Element Condition, and Notes & Comments.
- Condition:** Contains dropdown menus for NBI Rating (1A01 Deck, 1A04 Superstructure, 1A07 Unrep Spalls), 1A02 Substructure, 1A05 Channel, 1A03 Culvert, 1A06 Waterway, and 1A09 Inspection Status.
- Structure Appraisal:** Contains dropdown menus for 4A02 Approach Alignment, 4A03 Railing, 4A04 Transition, 4A05 Approach Guiderrail, 4A06 Approach Rail End, 4A07 Pier Protection, 4A08 Scour Critical, and 4B03 Posting.
- NBI Appraisal Rating - Calculated:** Contains dropdown menus for 4A09 Structural Eval, 4A10 Deck Geometry, 4A11 Underclearances, 4A12 SD/FO Status, and 4A13 Sufficiency Rating.
- Schedule Summary:** Contains dropdown menus for 7A01 Inspection Date, 7A02 Team Leader, and 7A03 Primary Type.
- 7A06 Inspection Performed:** Contains checkboxes for National Bridge Inventory, Element, and Fracture Critical.

Figure 4.5.2-1 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.

#### 4.5.3 Agency Inspection

The purpose of this screen is to allow users to view and maintain PennDOT-specific inspection information. The data on this screen corresponds to the BMS2 Pontis Agency - Inspection tab. These fields are PennDOT-specific inspection fields that were added to Pontis as a part of BMS2 Span1 implementation.

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 'Agency Inspection' page from the BMS2 web application. At the top, there are navigation links for File, Edit, View, Favorites, Tools, and Help, along with standard browser controls for Back, Forward, Stop, Refresh, and Home. The address bar shows the URL: <http://www.dot14.state.pa.us/BMS2Web/SVISPAGencyInspection?action=SHOW&BRKEY=13659&INSPKEY=0012>. The main header features the Pennsylvania Department of Transportation logo, the BMS2 logo, and the text 'BRIDGE MANAGEMENT SYSTEM 2'. A 'logout' link is visible in the top right corner.

The main content area is titled 'INSPECTION - AGENCY INSPECTION' and shows the date '03/12/2008 R - Regular (routine)'. There are several input fields and dropdown menus:

- Inventory Links:** Structure Home, Design, Agency Bridge, Drawing Notes, Features, Inspection Planning, Structure Units.
- Inspection Links:** Ratings & Schedule, Agency Inspection, Element Condition, Notes & Comments, Load Ratings, Fracture Critical, Underwater.
- Other Links:** Search Structures, Last Search Results, EDMS Documents, BP Assignment, Proposed Maintenance, Completed Maintenance, Bulletin Board Reports.
- Condition Rating Fields (e.g., 6B01, 6B02, 6B03, etc.):** Spc Insp Type, New Wear Srf Ind, Inventory Correction Ind, Deck Overlay Meas Dt, Est. Spall Delam %, Weather, Est. Spall Chloride %, Temperature, Deck Geom Appr Tbl, Est. Spall Chloride Dt, Under Cont Vert, Design Excpt.
- Struc Cond/Load Appraisal:** Appr Based on, ADT, Inventory Rating.
- Next Inspection:** Insp Type, Crane Insp Dt.
- Inspection Team:** Team Leader, Member, Hired By, Inspected By, Contract Num.

Figure 4.5.3-1 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.

#### 4.5.4 Element Condition

##### 4.5.4.1 Element List

The Element Condition screen allows users to view and edit the structure elements and condition states for a structure. The data on this screen includes fields from the BMS2 Pontis Condition tab and the Create/Edit Element Popup screen. 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.

The screenshot shows the 'Element List - Microsoft Internet Explorer provided by PENNDOT' window. At the top, there's a navigation bar with File, Edit, View, Favorites, Tools, and Help. Below it is a toolbar with Back, Forward, Stop, Refresh, Search, Favorites, and other icons. The address bar shows the URL: http://www.dot14.state.pa.us/BMS2Web/SVISElementList?action=show&BRKEY=13659&INSPKEY=0012. The main content area has a header 'INSPECTION-ELEMENT LIST' with a date '03/12/2008 R - Regular (routine)'. On the left, there are 'Inventory Links' for Structure Home, Agency Bridge, Features, and Structure Units, along with 'Design', 'Drawing Notes', 'Inspection Planning', and 'Posting'. In the center, there are 'Inspection Links' for Ratings & Schedule, Agency Inspection, Element Condition, and Notes & Comments, along with 'Load Ratings', 'Fracture Critical', and 'Underwater'. On the right, there are 'Other Links' for Search Structures, Last Search Results, EDMS Documents, BP Assignment, Proposed Maintenance, Completed Maintenance, Bulletin Board, and Reports. Below these links, there's an 'Add Element' button with a plus sign. Underneath, there's a section for 'Structure Unit' with a table:

| Structure Unit |                                                   | Type: F - Frame | Structure Unit ID: |           |           |           |           | Key: 3    |        |
|----------------|---------------------------------------------------|-----------------|--------------------|-----------|-----------|-----------|-----------|-----------|--------|
| Elem/Env       | 1B01 Element Description                          | 1A10 Qty        | UOM                | 1A11 Qty1 | 1A11 Qty2 | 1A11 Qty3 | 1A11 Qty4 | 1A11 Qty5 | Action |
| 999/1          | 999-Dummy element used for Pontis work candidates | 1.00            | each               | 1         | 0         | 0         | N/A       | N/A       |        |

At the bottom of the page, there's a message: 'You are currently logged in as **mahefel**. Your session will timeout in 30 minutes.' followed by 'PennDOT | BOAD | Pennsylvania' and 'Copyright © 2007 Pennsylvania Department of Transportation. All Rights Reserved.' There's also a link to 'PennDOT Privacy Policy'. The bottom status bar shows 'Session size : 55.4k', 'Version no : 002.020.000', and 'Unknown Zone (Mixed)'.

Figure 4.5.4.1-1 Element Condition Screen

#### 4.5.4.2 Element Detail

The Element Detail screen allows users to maintain detail information about the elements of the bridge. The screen displays information that corresponds to the Create/Edit Element Popup screen of BMS2 Pontis.

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 shows the 'Element Detail' page of the BMS2 web application. At the top, there's a navigation bar with links for File, Edit, View, Favorites, Tools, Help, Back, Search, Favorites, and a search bar. The address bar shows the URL: <http://www.dot14.state.pa.us/BMS2Web/SVISElementDetail?action>Show&BRKEY=13659&INSPKEY=0012&ELEMKEY=999&ENVKEY=1&STRUNITKEY=3>. The main header features the Pennsylvania Department of Transportation logo, the BMS2 logo, and the text 'BRIDGE MANAGEMENT SYSTEM 2'. A 'logout' link is also present.

The main content area is titled 'INSPECTION-ELEMENT LIST' with a date of '09/29/2005 R - Regular (routine)'. It includes several input fields and dropdown menus:

- SA01 SR ID:** 21008104140910
- SA03 BRKEY:** 13659
- Agency ID:**
- Go To:** Inspection-Element List

Below these are three sets of links:

- Inventory Links:** Structure Home, Design, Agency Bridge, Features, Structure Units.
- Inspection Links:** Ratings & Schedule, Agency Inspection, Element Condition, Notes & Comments.
- Other Links:** Search Structures, Last Search Results, EDMS Documents, BP Assignment, Proposed Maintenance, Completed Maintenance, Bulletin Board, Reports.

The main detail section is titled 'INSPECTION ELEMENT DETAIL' and contains the following data:

|                                                                    |                                                                                             |
|--------------------------------------------------------------------|---------------------------------------------------------------------------------------------|
| 1B01 Element ID: 999-Dummy element used for Pontis work candidates | 1B04 Quantity/Count: <input type="text" value="1.000"/> <input type="button" value="Each"/> |
| 1B02 Structure Unit: 3                                             | 1B05 Scale Factor: <input type="text"/>                                                     |
| 1B03 Environment: Ben.                                             | 1B06 Elem Rec Trigger: <input type="button" value="(blank)"/>                               |
| 1B07 Element Desc: Dummy placeholder element                       |                                                                                             |

Below this, there are radio buttons for 'Quantity' and 'Percent', and five input fields labeled 1A11 Qty1 through 1A11 Qty5. A section titled '1A12 ELEM COND' follows, which is currently empty.

At the bottom, a message says 'You are currently logged in as mafael. Your session will timeout in 30 minutes.' There are 'Done' and 'Unknown Zone (Mixed)' buttons at the very bottom.

Figure 4.5.4.2-1 Element Detail Screen

#### 4.5.5 Comments

##### 4.5.5.1 Comment Lists and Notes

The Inspection Comments List screen allows users to view and maintain inspection comments submitted from iForms. The fields on this screen correspond to the BMS2 Pontis Inspection Applet - Comments tab. The user is also provided the ability to edit the overall notes for an inspection, corresponding to the Inspection Notes field on the BMS2 Pontis Inspection desktop - Notes tab. 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.

| IC01 Comment Type       | IC02 Comment                                                                                                                                                       | Action                                                       |
|-------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|
| 1 - Approach Alignment  | NO REDUCTION IN SPEED NECESSARY                                                                                                                                    | <input checked="" type="checkbox"/> <input type="checkbox"/> |
| 2 - Appr Road/Pavement  | CONC. WITH ASPH. SUPER PAV. OVERLAY / MINOR TRANSVERSE AND LONG. CRACKING.                                                                                         | <input checked="" type="checkbox"/> <input type="checkbox"/> |
| 3 - Appr Road/Drainage  | GOOD                                                                                                                                                               | <input checked="" type="checkbox"/> <input type="checkbox"/> |
| 4 - Appr Road/Shoulders | ASPH. ( GOOD )                                                                                                                                                     | <input checked="" type="checkbox"/> <input type="checkbox"/> |
| 5 - Approach Slab       | CONC. WITH ASPH. OVERLAY - MINOR TRANS. AND LONG. CRACKING.                                                                                                        | <input checked="" type="checkbox"/> <input type="checkbox"/> |
| 7 - Bridge Railing      | CONC. MODIFIED PPT. / LITE SCALE @ VERT H/L CRACKING                                                                                                               | <input checked="" type="checkbox"/> <input type="checkbox"/> |
| 8 - Transition          | STEEL "S" POSTS WITH WOODEN OFFSET BLOCKS & STEEL PANEL / NO DEFECTS OBSERVED                                                                                      | <input checked="" type="checkbox"/> <input type="checkbox"/> |
| 9 - Appr Guiderrail     | STEEL "S" POSTS WITH WOODEN OFFSET BLOCKS & STEEL PANEL / NO DEFECTS OBSERVED                                                                                      | <input checked="" type="checkbox"/> <input type="checkbox"/> |
| 10 - Appr Rail End      | STEEL POST AND PANEL / NO DEFECTS OBSERVED                                                                                                                         | <input checked="" type="checkbox"/> <input type="checkbox"/> |
| 12 - Deck               | TOP: NOT VISIBLE UND: CONC. ( ONE PATCHED AREA AND A PRE SPALLED AREA BETWEEN BEAMS 4 AND 5 ,AND AN AREA AT NEAR LT. AND AT FAR RT. W/SOME EFL. & MINOR CRACKING ) | <input checked="" type="checkbox"/> <input type="checkbox"/> |
| 13 - Deck Drainage      | NONE                                                                                                                                                               | <input checked="" type="checkbox"/> <input type="checkbox"/> |
| 14 - Deck WS            | ASPH. SUPER PAV. OVERLAY / MINOR TRANS. AND LONG. CRACKING.                                                                                                        | <input checked="" type="checkbox"/> <input type="checkbox"/> |
| 15 - Superstructure     | GIRD: 6 P/S CONC. SPREAD BOX BEAMS / NO DEFECTS OBSERVED FBEAM: N/A STR: N/A TRUSS: N/A BEAR: NEOP. ( GOOD ) OTH: NONE                                             | <input checked="" type="checkbox"/> <input type="checkbox"/> |
| 16 - Super/Diaphragms   | CONC. ( VERY MINOR SMALL SPALLS AT BOTTOM ON SEVERAL )                                                                                                             | <input checked="" type="checkbox"/> <input type="checkbox"/> |
| 17 - Super/Portals      | N/A                                                                                                                                                                | <input checked="" type="checkbox"/> <input type="checkbox"/> |
| 18 - Super/Drainage     | NONE                                                                                                                                                               | <input checked="" type="checkbox"/> <input type="checkbox"/> |
| 72 - Cont lateral       | 6.0                                                                                                                                                                | <input checked="" type="checkbox"/> <input type="checkbox"/> |

Figure 4.5.5.1-1 Inspection Comments List Screen

#### 4.5.5.2 Inspection Comment Detail

The Inspection Comment Detail screen allows users to view and maintain detailed structure-level inspection comments similar to that provided by the BMS2 Pontis Inspection applet - Comment tab.

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.

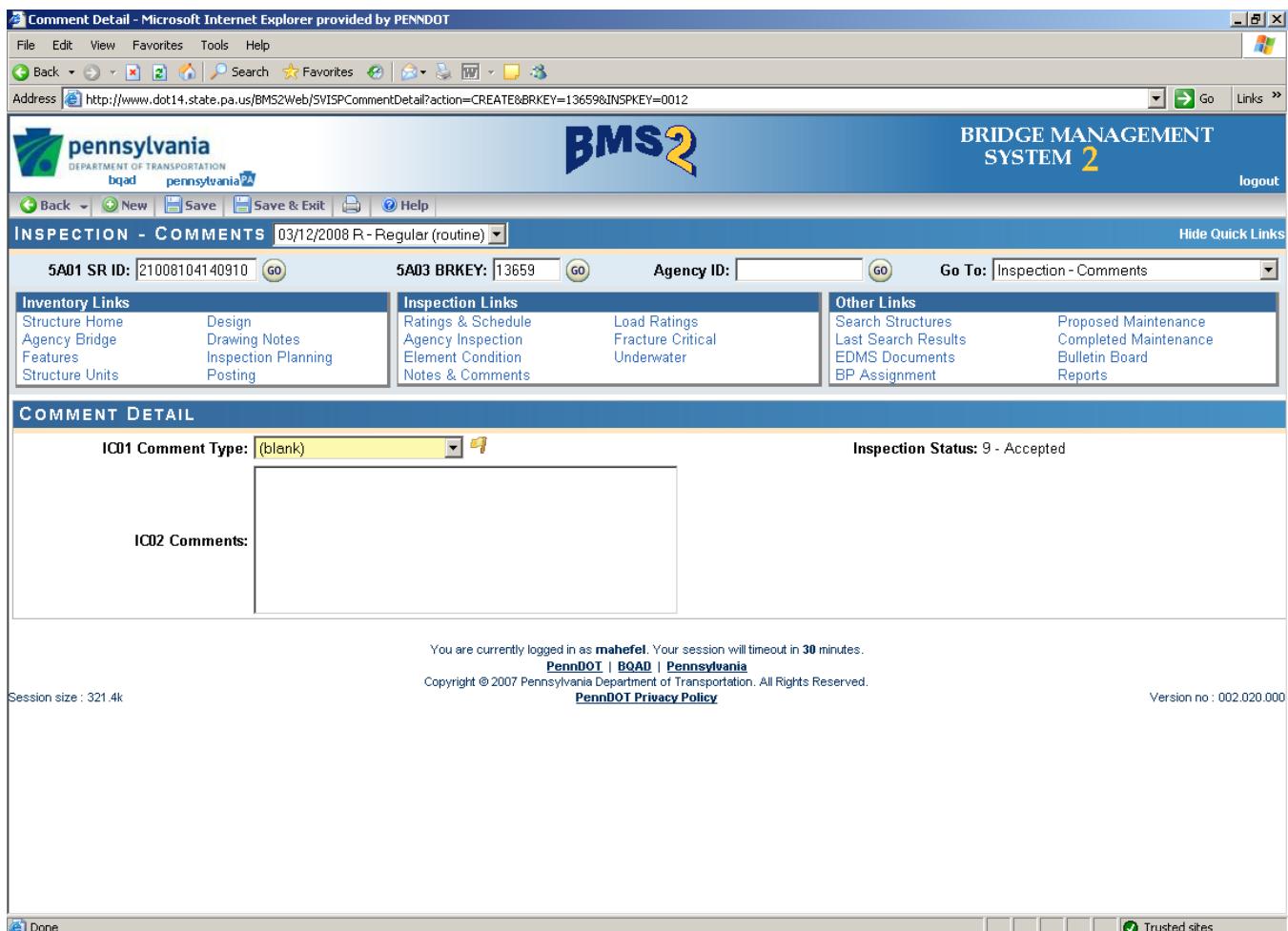


Figure 4.5.5.2-1 Inspection Comment Detail Screen

#### 4.5.5.3 Inspection Structure Unit Comment Detail

The Inspection Structure Unit Comment Detail screen allows users to view and maintain detailed structure unit-level inspection comments similar to that provided by the BMS2 Pontis Inspection applet - Comment tab.

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.

The screenshot shows a Microsoft Internet Explorer window displaying the BMS2 Web application. The title bar reads "Structure Unit Comment Detail - Microsoft Internet Explorer provided by PENNDOT". The address bar shows the URL: "http://www.dot14.state.pa.us/BMS2Web/SVINSStructureUnitCommentDetail?action=CREATE&BRKEY=13659&INSPKEY=0012". The page header includes the Pennsylvania Department of Transportation logo, the BMS2 logo, and the text "BRIDGE MANAGEMENT SYSTEM 2". The main content area is titled "INSPECTION - COMMENTS 03/12/2008 R - Regular (routine)". It contains several input fields: "SA01 SR ID: 21008104140910", "SA03 BRKEY: 13659", "Agency ID: [ ]", and "Go To: Inspection - Comments". Below these are three columns of links: "Inventory Links" (Structure Home, Agency Bridge, Features, Structure Units), "Inspection Links" (Design, Drawing Notes, Inspection Planning, Posting, Ratings & Schedule, Agency Inspection, Element Condition, Notes & Comments), and "Other Links" (Search Structures, Last Search Results, EDMS Documents, BP Assignment, Proposed Maintenance, Completed Maintenance, Bulletin Board, Reports). A large central area is titled "STRUCTURE UNIT COMMENT DETAIL". It contains fields for "IC03 Substructure Unit: 4-NAB" and "IC04 Inspection CommentType: (blank)". Below these is an "Inspection Status: 9 - Accepted" field and a large text area for "IC05 Comment". At the bottom of the page, there is a message about session timeout, copyright information (Copyright © 2007 Pennsylvania Department of Transportation. All Rights Reserved.), and a link to the PennDOT Privacy Policy. The footer also shows session details ("Session size : 321.8k") and a version number ("Version no : 002.020.000").

**Figure 4.5.5.3-1 Inspection Structure Unit Comment Detail Screen**

#### 4.5.6 Load Rating

##### 4.5.6.1 General Information and List

The Load Rating List screen allows users to view and maintain load ratings and rating sets similar to the BMS2 Pontis Inspection applet - Load Rating tab. 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. Similar to the BMS2 Pontis Inspection applet - Load Rating tab, the rating set assigned to the currently-displayed inspection is indicated in the Calc Date dropdown with an asterisk (\*).

*Note: Like the BMS2 Pontis Inspection applet - Load Rating tab, 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.

| IR04 Load Type       | IR05 NBI              | IR10 Inv Rating ton | IR11 Opr Rating ton | IR17 Rating Dataset | Action |
|----------------------|-----------------------|---------------------|---------------------|---------------------|--------|
| 1 - H Loading        | 0 - Not an NBI rating | 17                  | 50                  |                     |        |
| 2 - HS Loading       | 0 - Not an NBI rating | 26                  | 68                  |                     |        |
| 2 - HS Loading       | 1 - NBI rating        | 26                  | 68                  |                     |        |
| 8 - ML80/Ped/Special | 0 - Not an NBI rating | 19                  | 56                  |                     |        |

You are currently logged in as **mahefcl**. Your session will timeout in **30** minutes.  
[PennDOT](#) | [BQAD](#) | [Pennsylvania](#)  
Copyright © 2007 Pennsylvania Department of Transportation. All Rights Reserved.  
[PennDOT Privacy Policy](#)  
Session size : 336.5k Version no : 002.020.000  
[Done](#)

Figure 4.5.6.1-1 Load Rating List Screen

##### Generate a New Rating Set

An authorized user can create a new load rating set by clicking on Generate Rating Set button. When the Generate 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 Generate 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 Generate 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.

#### 4.5.6.2 Load Rating Detail

The Load Rating Detail screen allows users to view and maintain detailed load rating data similar to that provided by the BMS2 Pontis Inspection applet - Load Rating tab.

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 'Load Ratings Detail' page from the BMS2 web application. At the top, the URL is [http://www.dot14.state.pa.us/BMS2Web/SV1SPLoadRatingDetail.action=CREATE&BRKEY=13659&RATING\\_DATE=03/10/2006&INSPKEY=0012](http://www.dot14.state.pa.us/BMS2Web/SV1SPLoadRatingDetail.action=CREATE&BRKEY=13659&RATING_DATE=03/10/2006&INSPKEY=0012). The page header includes the Pennsylvania Department of Transportation logo, the BMS2 logo, and the 'BRIDGE MANAGEMENT SYSTEM 2' text. The main content area is titled 'INSPECTION - LOAD RATING' with a date of '03/12/2008 R - Regular (routine)'. The form contains several input fields and dropdown menus:

- IR01 SR ID: 21008104140910
- IR03 BRKEY: 13659
- Agency ID: [ ]
- Go To: Inspection - Load Rating
- Inventory Links: Structure Home, Agency Bridge, Features, Structure Units; Design, Drawing Notes, Inspection Planning, Posting
- Inspection Links: Ratings & Schedule, Agency Inspection, Element Condition, Notes & Comments; Load Ratings, Fracture Critical, Underwater
- Other Links: Search Structures, Last Search Results, EDMS Documents, BP Assignment; Proposed Maintenance, Completed Maintenance, Bulletin Board, Reports
- Load Rating Fields (dropdowns):
  - IR04 Load Type: (blank)
  - IR05 NBI: (blank)
  - IR06 Load Rating Meth: (blank)
  - IR07 Ctrl Memb Type: (blank)
  - IR08 Fatigue Stress Cat: (blank)
  - IR09 Fatigue Load Type: (blank)
  - IR16 Engineer: [ ]
  - IR10 Inventory Rating: (blank) ton
  - IR11 Operating Rating: (blank) ton
  - IR12 Govern Crit Inv: (blank)
  - IR13 Govern Crit Opr: (blank)
  - IR14 AASHTO Man Yr: [ ]
  - IR15 AASHTO Spec Yr: [ ]
  - IR18 Stress Range: [ ] ksi
  - IR17 Rating Dataset: [ ]
  - IR19 Notes: [Large text area]

Figure 4.5.6.2-1 Load Rating Detail Screen

#### 4.5.7 Fracture Critical

##### 4.5.7.1 General Information and List

The Fracture Critical List screen allows users to view and maintain fracture critical inspection data corresponding to the BMS2 Pontis Inspection applet - Fracture Critical tab. 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.

Figure 4.5.7.1-1 Fracture Critical List Screen

#### 4.5.7.2 Fracture Critical Detail

The Fracture Critical Detail screen allows users to view and maintain fracture critical inspection data corresponding to the BMS2 Pontis Inspection applet - Fracture Critical tab.

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 4.5.7.2-1 Fracture Critical Detail Screen

#### 4.5.8 Underwater

##### 4.5.8.1 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. The data on this screen corresponds to the BMS2 Inspection applet – Underwater tab.

The screenshot shows the BMS2 web application for bridge management. At the top, there's a navigation bar with links for File, Edit, View, Favorites, Tools, Help, Back, Search, Favorites, and a link to the Pennsylvania Department of Transportation (PennDOT) website. The main title is "INSPECTION - UNDERWATER" with a date of "03/12/2008 R - Regular (routine)". On the left, there are three columns of "Inventory Links": Structure Home, Design, Agency Bridge; Agency Features, Drawing Notes, Inspection Planning; and Structure Units, Posting. In the center, there are three columns of "Inspection Links": Ratings & Schedule, Agency Inspection, Element Condition; Load Ratings, Fracture Critical, Underwater; and Notes & Comments. On the right, there are three columns of "Other Links": Search Structures, Last Search Results, EDMS Documents; Proposed Maintenance, Completed Maintenance, Bulletin Board; and BP Assignment, Reports. Below these are several input fields and dropdown menus for inspection details like SCBI, Num Units, SCBI Source, and Inspection Status. There are also sections for "UW Reviewer Action" and "Reviewer Comments". At the bottom, there are sections for "SCBI", "SAR Calculation Data", and various status indicators like "US Right WW Presence" and "Condition". A "Done" button is at the very bottom left.

**Figure 4.5.8.1-1 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.

#### 4.5.8.2 Underwater Subunit List

The Underwater Subunit List screen allows users to view the list of subunits for a structure related to an underwater inspection. The data on this screen corresponds to the Subunit subtab of the BMS2 Inspection applet-Underwater tab.

The screenshot shows the 'Underwater - Sub Units' Microsoft Internet Explorer provided by PENNDOT. The top navigation bar includes File, Edit, View, Favorites, Tools, Help, Back, Forward, Stop, Refresh, Search, Favorites, Home, Mail, and Links. The address bar shows the URL: http://www.dot14.state.pa.us/BMS2Web/5VINPUWCCountMeasure?action=SUBUNITSHOW&BRKEY=13659&INSPKEY=0012. The main header features the Pennsylvania Department of Transportation logo, the BMS2 logo, and the text 'BRIDGE MANAGEMENT SYSTEM 2'. A 'logout' link is visible in the top right. Below the header, the title 'INSPECTION - UNDERWATER' is displayed, along with the date '03/12/2008 R - Regular (routine)'. A 'Go To:' dropdown menu is set to 'Inspection - Underwater'. The page contains several input fields and dropdown menus:

- Inventory Links:** Structure Home, Design, Drawing Notes, Agency Bridge, Features, Structure Units.
- Inspection Links:** Ratings & Schedule, Agency Inspection, Element Condition, Notes & Comments.
- Other Links:** Search Structures, Last Search Results, EDMS Documents, BP Assignment, Proposed Maintenance, Completed Maintenance, Bulletin Board, Reports.
- Form Fields:**
  - IA01 SR ID: 21008104140910
  - IA03 BRKEY: 13659
  - Agency ID: [empty]
  - Go To: Inspection - Underwater
  - IA09 Inspection Status: 9 - Accepted
  - IU01 Recalculate SCBI:
  - IU02 Num Units: 0
  - IA03 Primary Insp Type: R - Regular (routine)
  - IU03 SCBI Source: (blank)
  - 4A08 SCBI: N - Not Over Waterway
- Subunits Table:**

| IN01 Sub Unit | IN03 Scour Rating | IN13 INV Found Type | IN18 Water Depth | IU27 SCBI CODE | IU28 SCBI CASE | Action |
|---------------|-------------------|---------------------|------------------|----------------|----------------|--------|
| NAB           |                   |                     | -1               |                |                |        |
| FAB           |                   |                     | -1               |                |                |        |

At the bottom, a message states: 'You are currently logged in as **mahefel**. Your session will timeout in **30** minutes.' Logos for PennDOT, BQAD, and Pennsylvania are shown, along with copyright information: 'Copyright © 2007 Pennsylvania Department of Transportation. All Rights Reserved.' and 'PennDOT Privacy Policy'. Session size is listed as 356.3k, and the version number is 002.020.000. A 'Done' button and an 'Unknown Zone (Mixed)' status indicator are also present.

Figure 4.5.8.2-1 Underwater Subunit List Screen

#### 4.5.8.3 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 data on this screen corresponds to the Subunit sub-tab of the BMS2 Inspection applet- Underwater tab.

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.

**Underwater - SubUnit Detail - Microsoft Internet Explorer provided by PENNDOT**

File Edit View Favorites Tools Help

Back New Search Favorites Go Links

Address: http://www.dot14.state.pa.us/BMS2Web/SVSubUnitOsaDataDetail?action=CREATE&BRKEY=13659&INSPKEY=0012

**BMS2** BRIDGE MANAGEMENT SYSTEM 2 logout

**INSPECTION - UNDERWATER** 03/12/2008 R - Regular (routine) Hide Quick Links

5A01 SR ID: 21008104140910 Go 5A03 BRKEY: 13659 Go Agency ID: Go To: Inspection - Underwater

|                                                                |                                                           |                                                                                  |                                                 |                                                                             |                                                                            |
|----------------------------------------------------------------|-----------------------------------------------------------|----------------------------------------------------------------------------------|-------------------------------------------------|-----------------------------------------------------------------------------|----------------------------------------------------------------------------|
| <b>Inventory Links</b>                                         | <b>Inspection Links</b>                                   | <b>Other Links</b>                                                               |                                                 |                                                                             |                                                                            |
| Structure Home<br>Agency Bridge<br>Features<br>Structure Units | Design<br>Drawing Notes<br>Inspection Planning<br>Posting | Ratings & Schedule<br>Agency Inspection<br>Element Condition<br>Notes & Comments | Load Ratings<br>Fracture Critical<br>Underwater | Search Structures<br>Last Search Results<br>EDMS Documents<br>BP Assignment | Proposed Maintenance<br>Completed Maintenance<br>Bulletin Board<br>Reports |

**SUB UNIT DETAIL**

|                                      |                                               |
|--------------------------------------|-----------------------------------------------|
| 1A09 Inspection Status: 9 - Accepted | 7A03 Primary Insp Type: R - Regular (routine) |
| IN01 Sub Unit: 4-NAB                 | IN12 Pier/Abut Type: (blank)                  |
| IN02 Curr Ind:                       | IN13 Inv Found Type: (blank)                  |
| IN03 Scour Rating: (blank)           | IN14 Found_Type:                              |
| IN04 Change Since Last Insp: (blank) | IN15 Streambed Mat: (blank)                   |
| IN05 Scour hole: (blank)             | IN16 UW Insp Type: (blank)                    |
| IN06 Debris Pot: (blank)             | IN17 Ob Scour Depth: _____ ft                 |
| IN07 Scourability: (blank)           | IN18 Water Depth: _____ ft                    |
| IN08 Opening Adeq Channel: (blank)   | IN19 Movement Ind:                            |
| IN09 Sediment: (blank)               | IN20 Scour/Undermine Ind:                     |
| IN10 Alignment: (blank)              | IN21 Countermeasures:                         |
| IN11 Velocity Stream Slope: (blank)  | IN22 100 yr Flood Sc. Depth: _____ ft         |
| IN24 Notes                           | IN23 500 yr Flood Sc. Depth: _____ ft         |

Done Unknown Zone (Mixed)

Figure 4.5.8.3-1 Underwater Subunit Details Screen

#### 4.5.8.4 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 data on this screen corresponds to the Other sub-tab of the BMS2 Inspection applet- Underwater tab.

The screenshot shows the 'Underwater - Others' page from the BMS2 web application. At the top, there are navigation links for File, Edit, View, Favorites, Tools, and Help, along with a search bar and a favorites list. The address bar shows the URL: <http://www.dot14.state.pa.us/BMS2Web/SVINPUWCCountMeasure?action=OTHERSHOW&BRKEY=13659&INSPKEY=0012>. The main header features the Pennsylvania Department of Transportation logo, the BMS2 logo, and the text 'BRIDGE MANAGEMENT SYSTEM 2'. A 'logout' link is also present.

The main content area is titled 'INSPECTION - UNDERWATER' and shows the date '03/12/2008 R - Regular (routine)'. It includes several input fields and dropdown menus:

- Inventory Links:** Structure Home, Design, Agency Bridge, Drawing Notes, Features, Inspection Planning, Structure Units.
- Inspection Links:** Ratings & Schedule, Agency Inspection, Element Condition, Notes & Comments.
- Other Links:** Search Structures, Last Search Results, EDMS Documents, BP Assignment.
- Input Fields:**
  - IA01 SR ID: 21008104140910
  - IA03 BRKEY: 13659
  - Agency ID: [ ]
  - Go To: Inspection - Underwater
  - IA09 Inspection Status: 9 - Accepted
  - IU01 Recalculate SCBI:
  - IU02 Num Units: [ ]
  - IA03 Primary Insp Type: R - Regular (routine)
  - IU03 SCBI Source: (blank)
  - IU08 SCBI: N - Not Over Waterway
  - SCBI | Sub Units | Other
  - IL06 Waterway: N
  - IL02 Risk of Overtopping: (blank)
  - IL03 Traffic Delay: (blank)
  - IL04 Func Class: 01 - Rural Interstate
  - IL05 Elevation: [ ]
  - IL06 Date: 01/01/1901
  - IL07 New High Water: [ ]
  - IL08 High Water Notes: [ ]
  - Underclearance: [ ]

At the bottom, there is a message about session timeout, copyright information (Copyright © 2007 Pennsylvania Department of Transportation. All Rights Reserved.), and a privacy policy link ([PennDOT Privacy Policy](#)). Session size is listed as 357.8k, and the version number is 002.020.000. There are also 'Done' and 'Trusted sites' buttons at the bottom right.

Figure 4.5.8.4-1 Underwater Other Details Screen

## 4.6. Bridge-Related EDMS Documents

### 4.6.1 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.

| Inventory Links |                     | Inspection Links   |                   | Other Links         |                       |
|-----------------|---------------------|--------------------|-------------------|---------------------|-----------------------|
| Structure Home  | Design              | Ratings & Schedule | Load Ratings      | Search Structures   | Proposed Maintenance  |
| Agency Bridge   | Drawing Notes       | Agency Inspection  | Fracture Critical | Last Search Results | Completed Maintenance |
| Features        | Inspection Planning | Element Condition  | Underwater        | EDMS Documents      | Bulletin Board        |
| Structure Units | Posting             | Notes & Comments   |                   | BP Assignment       | Reports               |

| Inventory                     |                            | Records Per Page: 5 |               |
|-------------------------------|----------------------------|---------------------|---------------|
| Records 1 to 2 of 2           |                            | << < 1 > >>         |               |
| Document Type                 | Document Label/Description | Last Modified Date  | Source Action |
| Existing Structure Plan       | test as-built plan         | 11/07/2007          | EDMS          |
| Miscellaneous Inspection Data | Clearance Sheet            | 01/10/2008          | BMS           |

| Inspection          |                  | Records Per Page: 5 |               |
|---------------------|------------------|---------------------|---------------|
| Records 1 to 2 of 2 |                  | << < 1 > >>         |               |
| Inspection Date     | Document Type    | Last Modified Date  | Source Action |
| 05/02/2007          | Inspection Photo | 04/26/2008          | BMS           |
| 05/02/2007          | Inspection Photo | 11/06/2007          | EDMS          |

You are currently logged in as **mahefel**. Your session will timeout in **30** minutes.  
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Session size : 55.9k Version no : 002.020.000

Figure 4.6.1-1 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 Remove 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.

| Inventory Links |                     | Inspection Links   |                   | Other Links         |                       |
|-----------------|---------------------|--------------------|-------------------|---------------------|-----------------------|
| Structure Home  | Design              | Ratings & Schedule | Load Ratings      | Search Structures   | Proposed Maintenance  |
| Agency Bridge   | Drawing Notes       | Agency Inspection  | Fracture Critical | Last Search Results | Completed Maintenance |
| Features        | Inspection Planning | Element Condition  | Underwater        | EDMS Documents      | Bulletin Board        |
| Structure Units | Posting             | Notes & Comments   |                   | BP Assignment       | Reports               |

| Document Type                 | Document Label/Description | Last Modified Date | Source | Action |
|-------------------------------|----------------------------|--------------------|--------|--------|
| Existing Structure Plan       | test as-built plan         | 11/07/2007         | EDMS   |        |
| Miscellaneous Inspection Data | Clearance Sheet            | 01/10/2008         | BMS    |        |

| Inspection Date | Document Type    | Document Label/Description | Last Modified Date | Source | Action |
|-----------------|------------------|----------------------------|--------------------|--------|--------|
| 05/02/2007      | Inspection Photo |                            | 04/26/2008         | BMS    |        |
| 05/02/2007      | Inspection Photo | typical photos             | 11/06/2007         | EDMS   |        |

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**Figure 4.6.1-2 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.

#### 4.6.2 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 4.6.2-1 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.

#### 4.6.2.1 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 4.6.2.1-1 Edit Uploaded EDMS Document Screen**

#### 4.6.3 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 for the current structure must have been entered as the structure identifier when the document was created in EDMS.

The screenshot shows the BMS2 Web interface for linking EDMS documents. At the top, there's a navigation bar with links like 'STRUCTURE EDMS DOCUMENT LIST', 'Go To: Structure EDMS Document List', and 'Logout'. Below the navigation is a search bar with fields for 'SR ID' (5A01), 'BRKEY' (9286), and 'Agency ID'. The main area is titled 'LINK EDMS DOCUMENT' and contains three input fields: 'Document Type' (set to 'Accident/Incident Report - Bridge Inspection'), 'Document Label/Description', and 'Inspection Date'. A note at the bottom says 'You are currently logged in as mahefel. Your session will timeout in 30 minutes.' The footer includes session size (309.5k), privacy policy links (PennDOT | BQAD | Pennsylvania), and a version number (002.020.000).

**Figure 4.6.3-1 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.

| Document Type                | Document Label/Description | Last Modified Date | Source | Action                                                           |
|------------------------------|----------------------------|--------------------|--------|------------------------------------------------------------------|
| Bridge Design Correspondence | Test Doc for DocID Test 1  | 05/21/2007         |        | <a href="#">View</a> <a href="#">Edit</a> <a href="#">Remove</a> |
| Foundation Report            |                            | 05/24/2007         |        | <a href="#">View</a> <a href="#">Edit</a> <a href="#">Remove</a> |
| Bridge Design Correspondence |                            | 05/22/2007         |        | <a href="#">View</a> <a href="#">Edit</a> <a href="#">Remove</a> |

Figure 4.6.3-2 Updated EDMS Document List Screen

When multiple EDMS documents are associated with a particular link, the user is presented with the list of documents when the View link is clicked from the EDMS Document List screen.

| Document Id | Document Version | Title/Subject | Action               |
|-------------|------------------|---------------|----------------------|
| 003686080   | 1                |               | <a href="#">View</a> |
| 003686081   | 1                |               | <a href="#">View</a> |

Figure 4.6.3-3 EDMS Document Screen

## 4.7. 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.

### 4.7.1 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.

| Business Partner                        | Assigned Type | Action                              |
|-----------------------------------------|---------------|-------------------------------------|
| 000053 - McCormick Taylor, Inc.         | I - Inspector | <input checked="" type="checkbox"/> |
| 001391 - Federal Highway Administration | I - Inspector | <input checked="" type="checkbox"/> |

Figure 4.7.1-1 Business Partner Assignment Screen for Selected Structure

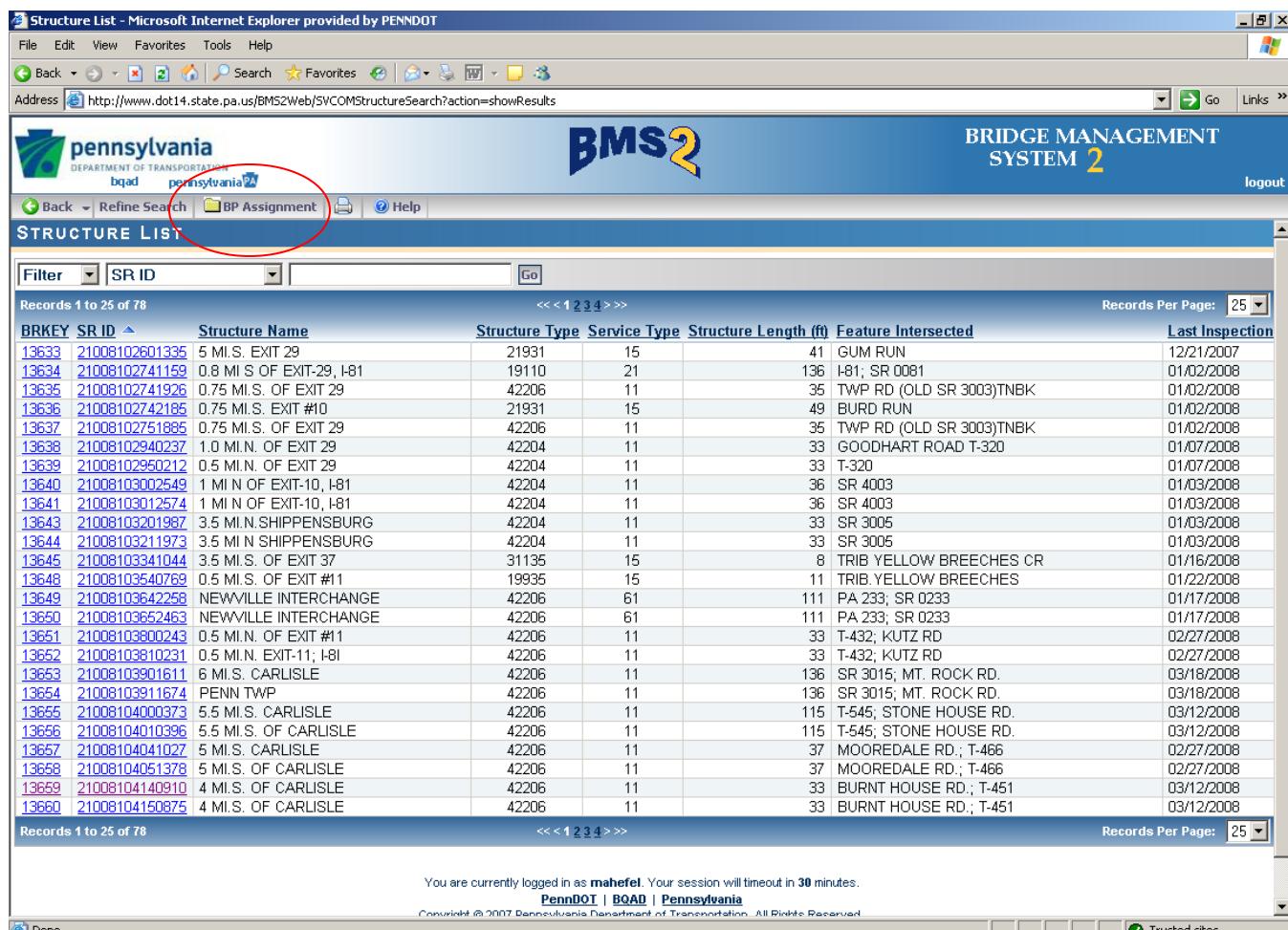
A New link is provided to create a new business partner assignment for the structure. A Remove link is provided to remove an existing business partner assignment. The screen does not restrict the number and types of assignments that can be made – a structure can be linked to multiple inspectors, owners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

#### 4.7.2 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.



The screenshot shows the BMS2 Structure List screen. At the top, there's a navigation bar with links for File, Edit, View, Favorites, Tools, and Help. Below that is a toolbar with Back, Forward, Stop, Refresh, and other standard browser controls. The address bar shows the URL: http://www.dot14.state.pa.us/BMS2Web/SVCOMStructureSearch?action=showResults. The main header features the Pennsylvania Department of Transportation logo, the BMS2 logo, and the text "BRIDGE MANAGEMENT SYSTEM 2". A "logout" link is visible on the right. Below the header, a menu bar includes Back, Refine Search, BP Assignment (which is circled in red), and Help. The main content area is titled "STRUCTURE LIST". It contains a table with columns: BRKEY, SR ID, Structure Name, Structure Type, Service Type, Structure Length (ft), Feature Intersected, and Last Inspection. The table lists various bridge structures with their details. At the bottom of the table, there are pagination controls ("Records 1 to 25 of 78" and page numbers 1-4) and a "Records Per Page" dropdown set to 25. The footer contains a message about session timeout, copyright information for PennDOT, BOAD, and Pennsylvania, and a "Trusted sites" checkbox.

Figure 4.7.2-1 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).

| BRKEY | SR ID           | Structure Name            | Structure Type | Service Type | Structure Length (ft) | Feature Intersected      | Last Inspection |
|-------|-----------------|---------------------------|----------------|--------------|-----------------------|--------------------------|-----------------|
| 13633 | 21008102601335  | 5 MI S. EXIT 29           | 21931          | 15           | 41                    | GUM RUN                  | 12/21/2007      |
| 13634 | 21008102741159  | 0.8 MI S OF EXIT-29, I-81 | 19110          | 21           | 136                   | I-81; SR 0081            | 01/02/2008      |
| 13635 | 21008102741926  | 0.75 MI S. OF EXIT 29     | 42206          | 11           | 35                    | TWP RD (OLD SR 3003)TNBK | 01/02/2008      |
| 13636 | 21008102742185  | 0.75 MI S. EXIT #10       | 21931          | 15           | 49                    | BURD RUN                 | 01/02/2008      |
| 13637 | 21008102751885  | 0.75 MI S. OF EXIT 29     | 42206          | 11           | 35                    | TWP RD (OLD SR 3003)TNBK | 01/02/2008      |
| 13638 | 21008102940237  | 1.0 MI N. OF EXIT 29      | 42204          | 11           | 33                    | GOODHART ROAD T-320      | 01/07/2008      |
| 13639 | 21008102950212  | 0.5 MI.N. OF EXIT 29      | 42204          | 11           | 33                    | T-320                    | 01/07/2008      |
| 13640 | 21008103002549  | 1 MI N OF EXIT-10, I-81   | 42204          | 11           | 36                    | SR 4003                  | 01/03/2008      |
| 13641 | 21008103012574  | 1 MI N OF EXIT-10, I-81   | 42204          | 11           | 36                    | SR 4003                  | 01/03/2008      |
| 13643 | 21008103201987  | 3.5 MI.N. SHIPPENSBURG    | 42204          | 11           | 33                    | SR 3005                  | 01/03/2008      |
| 13644 | 21008103211973  | 3.5 MI N SHIPPENSBURG     | 42204          | 11           | 33                    | SR 3005                  | 01/03/2008      |
| 13645 | 21008103341044  | 3.5 MI.S. OF EXIT 37      | 31135          | 15           | 8                     | TRIB YELLOW BREECHES CR  | 01/16/2008      |
| 13648 | 21008103540769  | 0.5 MI.S. OF EXIT #11     | 19935          | 15           | 11                    | TRIB. YELLOW BREECHES    | 01/22/2008      |
| 13649 | 21008103642256  | NEWVILLE INTERCHANGE      | 42206          | 61           | 111                   | PA 233; SR 0233          | 01/17/2008      |
| 13650 | 21008103652463  | NEWVILLE INTERCHANGE      | 42206          | 61           | 111                   | PA 233; SR 0233          | 01/17/2008      |
| 13651 | 21008103600243  | 0.5 MI.N. OF EXIT #11     | 42206          | 11           | 33                    | T-432; KUTZ RD           | 02/27/2008      |
| 13652 | 21008103810231  | 0.5 MI.N. EXIT-11; I-81   | 42206          | 11           | 33                    | T-432; KUTZ RD           | 02/27/2008      |
| 13653 | 21008103901611  | 6 MI S. CARLISLE          | 42206          | 11           | 136                   | SR 3015; MT. ROCK RD.    | 03/18/2008      |
| 13654 | 21008103911674  | PENN TWP                  | 42206          | 11           | 136                   | SR 3015; MT. ROCK RD.    | 03/18/2008      |
| 13655 | 21008104000373  | 5.5 MI S. CARLISLE        | 42206          | 11           | 115                   | T-545; STONE HOUSE RD.   | 03/12/2008      |
| 13656 | 21008104010396  | 5.5 MI.S. OF CARLISLE     | 42206          | 11           | 115                   | T-545; STONE HOUSE RD.   | 03/12/2008      |
| 13657 | 210081040401027 | 5 MI.S. CARLISLE          | 42206          | 11           | 37                    | MOOREDALE RD.; T-466     | 02/27/2008      |
| 13658 | 21008104051378  | 5 MI S. OF CARLISLE       | 42206          | 11           | 37                    | MOOREDALE RD.; T-466     | 02/27/2008      |
| 13659 | 21008104140910  | 4 MI.S. OF CARLISLE       | 42206          | 11           | 33                    | BURNT HOUSE RD.; T-451   | 03/12/2008      |
| 13660 | 21008104150875  | 4 MI.S. OF CARLISLE       | 42206          | 11           | 33                    | BURNT HOUSE RD.; T-451   | 03/12/2008      |

Figure 4.7.2-2 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).

## 4.8.Maintenance

### 4.8.1 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.

| # | IM02 Element | IM03 Action                 | IM05 Priority         | IM06 Date Recom | IM07 Status          | Action                                                                  |
|---|--------------|-----------------------------|-----------------------|-----------------|----------------------|-------------------------------------------------------------------------|
| 1 | N/A          | 1-B743101-FLUSH SCUP/DNSPTG | 5 - Routine Non-Struc | 03/30/1999      | 3 - Work sent to SAP | <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> |
| 2 | N/A          | 23-A743101-CLEAN/FLUSH DK   | 5 - Routine Non-Struc | 03/28/2001      | 3 - Work sent to SAP | <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> |

Items highlighted in yellow have been submitted to SAP

Show Completed Work Candidates

Records 1 to 2 of 2

Records Per Page: 5

You are currently logged in as **mahefel**. Your session will timeout in 26 minutes.  
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Session size : 313.9k Version no : 002.020.000

Figure 4.8.1-1 Proposed Maintenance List Screen

#### 4.8.2 Proposed Maintenance Detail Screen

The Proposed Maintenance Detail screen allows users to view and maintain detailed structure-level proposed maintenance items similar to that provided by the BMS2 Pontis Inspection applet.

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.

The screenshot displays the 'Proposed Maintenance Detail' page from the BMS2 web application. At the top, there's a navigation bar with links for File, Edit, View, Favorites, Tools, Help, Back, New, Save, Save & Exit, Help, and Links. The address bar shows the URL: <http://www.dot14.state.pa.us/BMS2Web/SVISPProposedMaintenanceDetail?action=Create&BRKEY=9286>. The main header features the Pennsylvania Department of Transportation logo, the BMS2 logo, and the text 'BRIDGE MANAGEMENT SYSTEM 2'. A 'logout' link is also present.

The main content area is titled 'MAINTENANCE - PROPOSED MAINTENANCE'. It includes several search and filter fields: 'SA01 SR ID: 14008013820000' with a 'GO' button, 'SA03 BRKEY: 9286' with a 'GO' button, 'Agency ID:' with a 'GO' button, and a dropdown menu 'Go To: Maintenance - Proposed Maintenance'. Below these are three groups of 'Links': 'Inventory Links' (Structure Home, Agency Bridge, Features, Structure Units), 'Inspection Links' (Design, Drawing Notes, Inspection Planning, Posting, Ratings & Schedule, Agency Inspection, Element Condition, Notes & Comments, Load Ratings, Fracture Critical, Underwater), and 'Other Links' (Search Structures, Last Search Results, EDMS Documents, BP Assignment, Proposed Maintenance, Completed Maintenance, Bulletin Board, Reports). A 'Hide Quick Links' button is located in the top right corner of this section.

The central part of the screen is titled 'PROPOSED MAINTENANCE DETAIL'. It contains numerous input fields labeled IM01 through IM15d. These include dropdown menus for 'IM01 Scope' (Flexaction), 'IM03 Action' (with a dropdown arrow), 'IM04 Est Quantity' (ea.), 'IM05 Priority' (blank), 'IM06 Date Recom' (with a calendar icon), 'IM07 Status' (blank), 'IM14 Comp Date' (with a calendar icon), 'IM15a Notes' (a large text area), 'IM15b Deferred Notes' (another large text area), and checkboxes for 'IM08 Target Year', 'IM09 Location', 'IM10 Est Cost', 'IM11 Work Assign' (blank), 'IM12 Drawing Ind' (checkbox), 'IM13 Permit Ind' (checkbox), 'IM15c Bridge Appr' (text area), and 'IM15d Maint Appr' (text area). At the bottom left is a 'Done' button, and at the bottom right is a note about an 'Unknown Zone (Mixed)'.

**Figure 4.8.2-1 Proposed Maintenance Detail Screen**

#### 4.8.3 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.

| IM01 Scope | IM02 Element | IM03 Action               | IM05 Priority | IM07 Status        | IM14 Comp Date | Action |
|------------|--------------|---------------------------|---------------|--------------------|----------------|--------|
| FLEXACTION | N/A          | 23-A743101-CLEAN/FLUSH DK |               | 5 - Completed/Dept | 05/22/2008     |        |
| FLEXACTION | N/A          | 89-Converted AG           |               |                    | 11/01/1990     |        |

You are currently logged in as **mahefel**. Your session will timeout in **30** minutes.  
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Figure 4.8.3-1 Completed Maintenance Screen

#### 4.8.4 Completed Maintenance Detail Screen

The Completed Maintenance Detail screen allows users to view and maintain detailed structure-level completed maintenance items similar to that provided by the BMS2 Pontis Inspection applet.

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

**Figure 4.8.4-1 Completed Maintenance Detail Screen**

#### 4.8.5 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.

#### 4.9 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 4.9.1. 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.

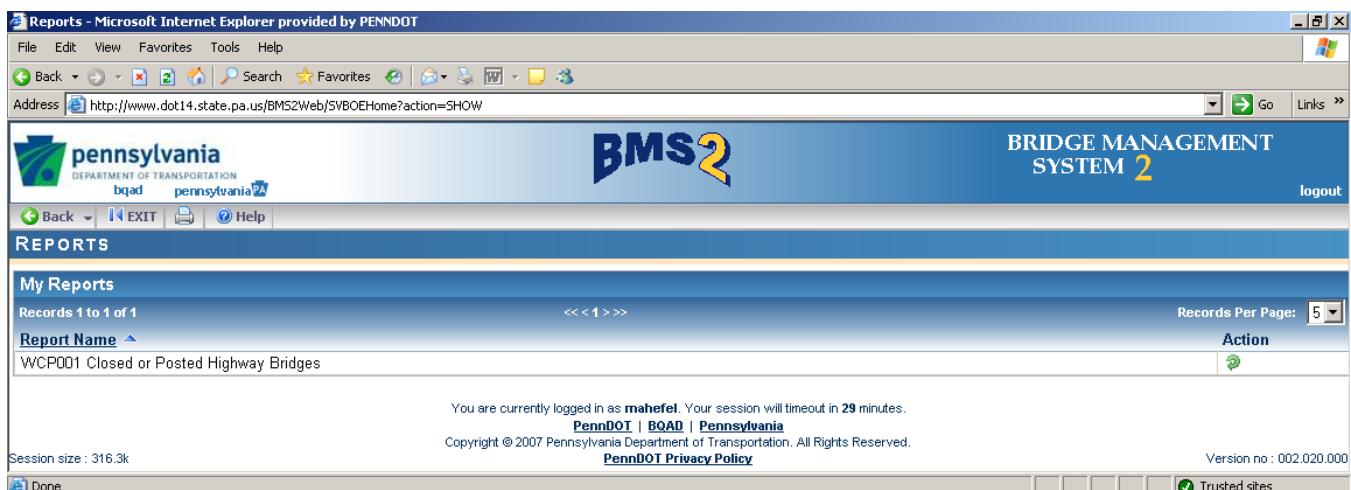


Figure 4.9-1 Reports Screen

## 4.10. 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.

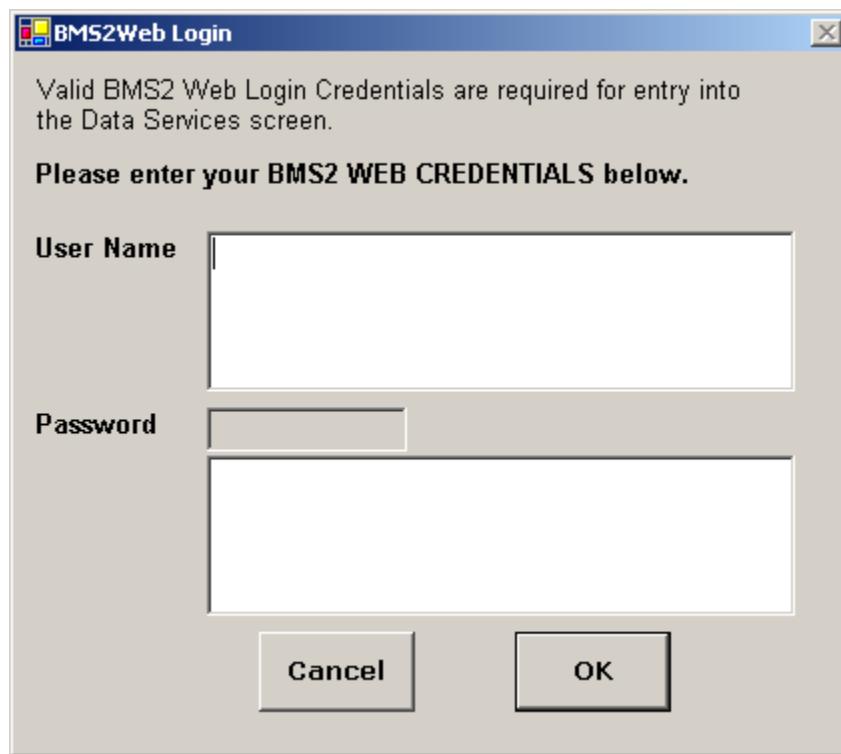
Due to the availability of the iForms web services across the Internet, all users – PennDOT and non-PennDOT – will be required to enter their BMS2 Web userid and password when submitting inspections from iForms or requesting the download of inspection data to iForms from BMS2. iForms also provides the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

### 4.10.1 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 uses 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.



**Figure 4.10.1-1 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 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.

#### 4.10.2 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

##### 4.10.2.1 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.

The screenshot shows the BMS2 - iForms - [BMS2 Data Services] application window. The menu bar includes File, DataServices, Window, and Help. The main interface has several sections:

- Top Left:** A checkbox labeled "Use iForms to perform QA inspections". To its right is a "Retrieve Code and Reference" button.
- Section Header:** "Choose the initial filter for the structures to be considered:"
- Filter Options:** Radio buttons for "Select County" (selected) and "Select District". Below them is a dropdown menu set to "21 - Cumberland" with a pencil icon for editing. To the right is a "Retrieve List" button.
- Section Header:** "Structures Available for Inspection:"
- Buttons:** "Select All", "Deselect All", and "Retrieve Inspections for Selected Structures".
- Filter Options:** "Select Electronic Documents to Download:" with checkboxes for "Inventory" (unchecked) and "Inspection" (checked). To the right is the text "Structures in this Listing: 637".
- Data Grid:** A large table listing 15 structures. The columns are: Download? (checkbox), EDocs? (checkbox), SR ID, Ref ID, Structure Name, District, Cnty, and Team. The rows show various structure names like "East Pine Street Over Mou", "1 MI.N. OF CARLISLE", etc., with their respective details.
- Bottom Status Bar:** "List Retrieved" and the date/time "6/23/2008 3:14:27 PM".

4.11. Figure

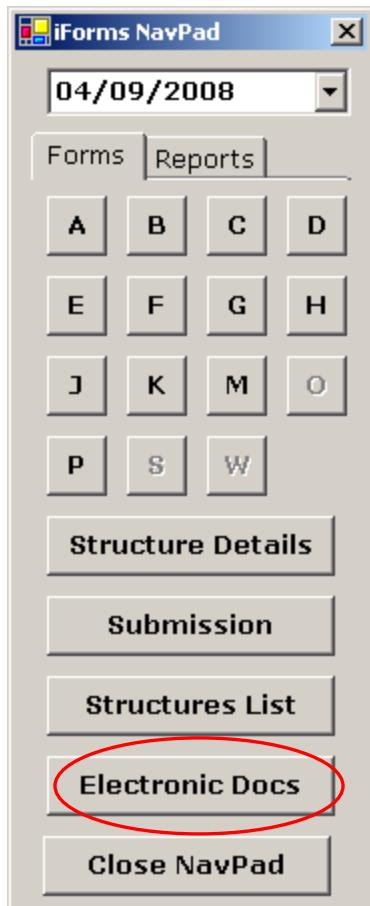
4.10.2.1-1

Data

Services

Screen

#### 4.10.2.2 Electronic Documents Screen



**Figure 4.10.2.2-1 NavPad  
Electronic Documents  
Button**

associations. No specific viewer functionality is provided within BMS2

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

**BMS2 - iForms - [Electronic Documents]**

File DataServices Window Help

SR ID: 21007402600000    **1A09** Status: 9 - Accepted

Inspection Date: 04/09/2008     Metric     English     QA Mode

Save Cancel NAVPAD

**Download Selected eDocs**

Local Electronic Document Directory:  
C:\BMS2\iForms\DOCUMENTS\21007402600000\

**Inventory Related Documents**

Select All

|   | DWN                      | Description/Doc Label | Local File Name | Type           | Status | View                            |
|---|--------------------------|-----------------------|-----------------|----------------|--------|---------------------------------|
| ▶ | <input type="checkbox"/> | S-5323                |                 | Existing Struc | BMS    | <input type="button" value=""/> |

**Inspection Related Documents**

Select All

|   | DWN | Description/Doc Label | Local File Name | Type | Status | View |
|---|-----|-----------------------|-----------------|------|--------|------|
| ▶ |     |                       |                 |      |        |      |

Figure 4.10.2.2-2 eDocuments Screen

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## **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 |                         |          |                     |
| <b>IDENTIFICATION</b>                                                    |                         |          |                     |
| 5A01                                                                     | Structure ID            |          |                     |
| 5A02                                                                     | Name                    |          |                     |
| 5A03                                                                     | NBI Structure No.       | BRKEY    |                     |
| <b>LOCATION/SERVICE/MANAGEMENT</b>                                       |                         |          |                     |
| 5A04                                                                     | District                |          |                     |
| 5A06                                                                     | City/Town/Place         |          |                     |
| 5A08                                                                     | Facility Carried        |          |                     |
| 5A10                                                                     | Latitude                |          |                     |
| 5A15                                                                     | Year Built              |          |                     |
| 5A18                                                                     | Under                   |          |                     |
| 5A20                                                                     | Maint Resp              |          |                     |
| 5A05                                                                     | County                  |          |                     |
| 5A07                                                                     | Feature Intersect       |          |                     |
| 5A09                                                                     | Location                |          |                     |
| 5A11                                                                     | Longitude               |          |                     |
| 5A17                                                                     | Type of Service On      |          |                     |
| 5A19                                                                     | #Lanes Under            |          |                     |
| 5A21                                                                     | Owner                   |          |                     |
| <b>DECK/SPAN INFORMATION</b>                                             |                         |          |                     |
| 5B02                                                                     | Deck Surface Type       |          |                     |
| 5B04                                                                     | Deck Protection         |          |                     |
| 5B06                                                                     | Right Curb Width        |          |                     |
| 5B09                                                                     | Skew                    |          |                     |
| 5B11                                                                     | No. Of Main Spans       |          |                     |
| 5B17                                                                     | Max. Span Length        |          |                     |
| 5B20                                                                     | Total Length            |          |                     |
| 5B03                                                                     | Deck Mem. Type          |          |                     |
| 5B05                                                                     | Left Curb Width         |          |                     |
| 5B07                                                                     | Deck Width              |          |                     |
| 5B10                                                                     | Structure Flared        |          |                     |
| 5B14                                                                     | No. of Appr. Spans      |          |                     |
| 5B18                                                                     | Structure Length        |          |                     |
| Notes:                                                                   |                         |          |                     |
| <b>CLASSIFICATION</b>                                                    |                         |          |                     |
| 5E01                                                                     | NBIS Bridge Length      |          |                     |
| 5E03                                                                     | Temporary Struc.        |          |                     |
| 5E02                                                                     | Parallel Structure      |          |                     |
| 5E04                                                                     | Historical Significance |          |                     |
| <b>GENERAL</b>                                                           |                         |          |                     |
| 4A08                                                                     | SCBI                    |          |                     |
| 6A06                                                                     | Sub Agency              |          |                     |
| 6A23                                                                     | Owner Desc.             |          |                     |
| VP02                                                                     | Posting Status          |          |                     |
| 6A19                                                                     | Bus. Plan Ntwk.         |          |                     |
| <b>STRUCTURE TYPE</b>                                                    |                         |          |                     |
| 6A26                                                                     | Main                    | Approach |                     |
| 6A27                                                                     | Material                |          |                     |
| 6A28                                                                     | Physical                |          |                     |
| 6A29                                                                     | Span Interact           |          |                     |
| 6A29                                                                     | Struct. Config.         |          |                     |
| <b>DECK INFO</b>                                                         |                         |          |                     |
| 6A38                                                                     | Dept. Struct. Type      |          |                     |
| 6A42                                                                     | Rebar type              | 6A41     | No. of joints       |
| 6A42                                                                     |                         | 6A43     | Appr. Pav. Width    |
| <b>FRACTURE CRITICAL</b>                                                 |                         |          |                     |
| 6A44                                                                     | Main                    | Approach |                     |
| 6A45                                                                     | Group No.               |          |                     |
| 6A46                                                                     | Mem. Type               |          |                     |
| 6A47                                                                     | Fatig. Sus.             |          |                     |
| 6A48                                                                     | Material                |          |                     |
| 6A48                                                                     | ADTT                    |          |                     |
| <b>ROADWAY</b>                                                           |                         |          |                     |
| 5C15                                                                     | Detour Length           |          |                     |
| 5C26                                                                     | Appr. Road              |          |                     |
| 5C27                                                                     | Roadway                 |          |                     |
| <b>LOAD RATING</b>                                                       |                         |          |                     |
| IR03                                                                     | Calculation Date        |          |                     |
| IR04                                                                     | Load Type               | IR06     | Load Rating. Method |
| IR05                                                                     | NBI                     | IR10     | Inventory Rating    |
| IR05                                                                     |                         | IR11     | Operating Rating    |

**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**

|                       |                       |                              |                       |                       |
|-----------------------|-----------------------|------------------------------|-----------------------|-----------------------|
| <b>ADAMS - 01</b>     | 427 EDGEWORTH         | 121 SPRINGDALE               | <b>BEAVER - 04</b>    | 411 SAXTON            |
| District 8-0          | 428 ELIZABETH         | 122 STOWE                    | District 11-0         | 412 SCHELLSBURG       |
|                       | 429 EMSWORTH          | 123 UPPER ST CLAIR           |                       | 413 WOODBURY          |
| Boroughs:             | 430 ETNA              | 124 WILKINS                  | Cities:               |                       |
| 401 ABBOTTSTOWN       | 431 FOREST HILLS      | 125 ALEPO                    | 301 BEAVER FALLS      | Townships, 2nd Class: |
| 402 ARENTSVILLE       | 432 FOX CHAPEL        | 126 KENNEDY                  | 302 ALIQUIPPA         | 201 BEDFORD           |
| 403 BENDERSVILLE      | 433 GLASSPORT         |                              |                       | 202 BLOOMFIELD        |
| 404 BIGLERVILLE       | 434 GLENFIELD         | Townships, 2nd Class:        |                       | 203 BROADTOP          |
| 405 EAST BERLIN       | 435 GREENTREE         | 202 FAWN                     | 402 AMBRIDGE          | 204 COLERAIN          |
| 406 FAIRFIELD         | 436 HAYSVILLE         | 203 FINDLAY                  | 403 BADEN             | 205 CUMBERLAND VALLEY |
| 407 GETTYSBURG        | 437 HEIDELBERG        | 204 FORWARD                  | 404 BEAVER            | 206 EAST PROVIDENCE   |
| 408 LITTLESTOWN       | 438 HOMESTEAD         | 206 FRAZER                   | 405 BIG BEAVER        | 207 EAST ST CLAIR     |
| 409 MCSHERRYSTOWN     | 439 INGRAM            | 207 HAMPTON                  | 406 BRIDGEWATER       | 208 HARRISON          |
| 410 NEW OXFORD        | 440 JEFFERSON HILLS   | 208 HARMAR                   | 407 CONWAY            | 209 HOPEWELL          |
| 411 YORK SPRINGS      | 441 LEETSDALE         | 209 INDIANA                  | 408 DARLINGTON        | 210 JUNIATA           |
| 412 BONNEAUVILLE      | 442 LIBERTY           | 211 KILBUCK                  | 409 EAST ROCHESTER    | 211 KIMMEL            |
| 413 CARROLL VALLEY    | 443 LINCOLN           | 212 MARSHALL                 | 410 EASTVALE          | 212 KING              |
|                       | 444 MCKEES ROCKS      | 213 MOON                     | 411 ECONOMY           | 213 LIBERTY           |
|                       | 445 MILLVALE          | 214 NORTH FAYETTE            | 412 FALLSTON          | 214 LINCOLN           |
| 201 BERWICK           | 446 MONROEVILLE       | 215 OHIO                     | 413 FRANKFORT SPRIN   | 215 LONDONDERRY       |
| 202 BUTLER            | 447 MT OLIVER         | 216 PINE                     | 414 FREEDOM           | 216 MANN              |
| 203 CONEWAGO          | 448 MUNHALL           | 217 RICHLAND                 | 415 GEORGETOWN        | 217 MONROE            |
| 204 CUMBERLAND        | 449 NORTH BRADDOCK    | 219 SOUTH PARK               | 416 GLASGOW           | 218 NAPIER            |
| 205 FRANKLIN          | 450 OAKDALE           | 220 WEST DEER                | 417 HOMEWOOD          | 219 SNAKE SPRING      |
| 206 FREEDOM           | 451 OAKMONT           |                              | 418 HOOKSTOWN         | 220 SOUTH WOODBURY    |
| 207 GERMANY           | 452 OSBORNE           | <b>ARMSTRONG - 03</b>        | 419 INDUSTRY          | 221 SOUTH WOODBURY    |
| 208 HAMILTON          | 453 PITCAIRN          | District 10-0                | 420 KOPPEL            | 222 PAVIA             |
| 209 HAMILTONBAN       | 454 PLEASANT HILLS    | Cities:                      | 421 MIDLAND           | 226 WEST PROVIDENCE   |
| 210 HIGHLAND          | 455 PORT VUE          | 301 PARKER CITY              | 422 MONACA            | 227 WEST ST CLAIR     |
| 211 HUNTINGTON        | 456 RANKIN            | Boroughs:                    | 423 NEW BRIGHTON      | 228 WOODBURY          |
| 212 LATIMORE          | 457 ROSSLYN FARMS     | 401 APOLLO                   | 424 NEW GALILEE       |                       |
| 213 LIBERTY           | 458 SEWICKLEY         | 402 APPLEWOLD                | 425 PATTERSON HEIGHTS | <b>BERKS - 06</b>     |
| 214 MENALLEN          | 459 SEWICKLEY HEIGH   | 403 ATWOOD                   | 426 ROCHESTER         | District 05-0         |
| 215 MOUNT JOY         | 460 SEWICKLEY HILLS   | 404 DAYTON                   | 427 SHIPPINGPORT      |                       |
| 216 MOUNT PLEASANT    | 461 SHARPSBURG        | 405 ELDERTON                 | 428 SOUTH HEIGHTS     | Cities:               |
| 217 OXFORD            | 462 SPRINGDALE        | 406 FORD CITY                | 429 WEST MAYFIELD     | 301 READING           |
| 218 READING           | 463 SWISSVALE         | 407 FORD CLIFF               | 430 OHIOVILLE         |                       |
| 219 STRABAN           | 464 TARENTUM          | 408 FREEPORT                 |                       | Boroughs:             |
| 220 TYRONE            | 465 THORNBURG         | 409 KITTANNING               | 401 BALLY             |                       |
| 221 UNION             | 466 PLUM              | 410 LEECHBURG                | 402 BECHTELSVILLE     |                       |
|                       | 467 TURTLE CREEK      | 411 MANORVILLE               | 403 BERNVILLE         |                       |
| <b>ALLEGHENY - 02</b> | 468 VERONA            | 412 NORTH APOLLO             | 404 BIRDSBORO         |                       |
| District 11-0         | 469 VERSAILLES        | 414 RURAL VALLEY             | 405 BOYERTOWN         |                       |
| Cities:               | 470 WALL              | 415 SOUTH BETHLEHEM          | 406 CENTERPORT        |                       |
|                       | 471 WEST ELIZABETH    | 416 WEST KITTANNING          | 407 FLEETWOOD         |                       |
| 301 PITTSBURGH        | 472 WEST HOMESTEAD    | 417 WORTHINGTON              | 408 HAMBURG           |                       |
| 302 CLAIRTON          | 473 WEST MILFIN       |                              | 409 KENHORST          |                       |
| 303 DUQUESNE          | 474 WEST VIEW         | <b>Townships, 2nd Class:</b> | 410 KUTZTOWN          |                       |
| 304 MCKEESPORT        | 475 WHITAKER          | 201 BETHEL                   | 411 LAURELDALE        |                       |
| Boroughs:             | 476 WHITEHALL         | 202 BOGGS                    | 412 LENHARTSVILLE     |                       |
| 401 ASPINWALL         | 477 WHITE OAK         | 203 BRADYS BEND              | 413 LYONS             |                       |
| 402 AVALON            | 478 WILKINSBURG       | 204 BURRELL                  | 414 MOHNTON           |                       |
| 403 BALDWIN           | 479 WILMERDING        | 205 CADOGAN                  | 415 MT PENN           |                       |
| 404 BELLEVUE          | 480 BELL ACRES        | 206 COWANSHANNOCK            | 416 ROBESONIA         |                       |
| 405 BEN AVON          | 481 FRANKLIN PARK     | 207 EAST FRANKLIN            | 417 ST LAWRENCE       |                       |
| 406 BEN AVON HEIGHT   | Townships, 1st Class: | 208 GILPIN                   | 418 SHILLINGTON       |                       |
| 407 BETHEL PARK       | 101 BALDWIN           | 209 HOVEY                    | 419 SHOEMAKERSVILLE   |                       |
| 408 BLAWNOX           | 102 COLLIER           | 210 KISKIMINETAS             | 420 SINKING SPRING    |                       |
| 409 BRACKENRIDGE      | 103 CRESCENT          | 211 KITTANNING               | 421 STRAUSSTOWN       |                       |
| 410 BRADDOCK          | 104 EAST DEER         | 212 MADISON                  | 422 TEMPLE            |                       |
| 411 BRADDOCK HILLS    | 105 ELIZABETH         | 213 MAHONING                 | 423 TOPTON            |                       |
| 412 BRADFORDWOODS     | 106 HARRISON          | 214 MANOR                    | 424 WERNERSVILLE      |                       |
| 413 BRENTWOOD         | 107 LEET              | 215 NORTH BUFFALO            | 425 WEST LAWN         |                       |
| 414 BRIDGEVILLE       | 108 MCCANDLESS        | 216 PARKS                    | 426 LEESPORT          |                       |
| 415 CARNEGIE          | 109 MT LEBANON        | 217 PERRY                    | 427 WEST READING      |                       |
| 416 CASTLE SHANNON    | 110 NEVILLE           | 218 PINE                     | 428 WOMELSDORF        |                       |
| 417 CHALFANT          | 111 NORTH VERSAILLE   | 219 PLUMCREEK                | 429 WYOMISSING        |                       |
| 418 CHESWICK          | 112 OHARA             | 220 RAYBURN                  | 430 WYOMISSING HILL   |                       |
| 419 CHURCHILL         | 113 PENN HILLS        | 221 REDBANK                  | 431 NEW MORGAN        |                       |
| 420 CORAOPOLIS        | 114 RESERVE           | 222 SOUTH BEND               |                       | Townships, 1st Class: |
| 421 CRAFTON           | 115 ROBINSON          | 223 SOUTH BUFFALO            | 401 BEDFORD           | 101 COLEBROOKDALE     |
| 422 DORMONT           | 116 ROSS              | 224 SUGARCREEK               | 402 COALDALE          | 102 MUHLENBERG        |
| 423 DRAVOSBURG        | 117 SCOTT             | 225 VALLEY                   | 403 EVERETT           | 103 CUMRU             |
| 424 EAST MCKEESPORT   | 118 SHALER            | 226 WASHINGTON               | 404 HOPEWELL          |                       |
| 425 EAST PITTSBURGH   | 119 SOUTH FAYETTE     | 227 WAYNE                    | 405 HYNDMAN           | Townships, 2nd Class: |
| 426 EDGEWOOD          | 120 SOUTH VERSAILLE   | 228 WEST FRANKLIN            | 406 MANNS CHOICE      | 201 ALBANY            |
|                       |                       |                              | 407 NEW PARIS         | 202 ALSACE            |
|                       |                       |                              | 408 PLEASANTVILLE     |                       |
|                       |                       |                              | 409 RAINSBURG         |                       |
|                       |                       |                              | 410 SAINT CLAIRSVIL   |                       |

## **APPENDIX B**

### **Coding for Item 5A06**

| BERKS - 06 (cont)     |  | BRADFORD - 08         |  | 417 RIEGELSVILLE      |  | Townships, 2nd Class: |  | Townships, 2nd Class: |  |
|-----------------------|--|-----------------------|--|-----------------------|--|-----------------------|--|-----------------------|--|
| District 05-0         |  | District 03-0         |  | 418 SELLERSVILLE      |  | 201 ADAMS             |  | 201 ADAMS             |  |
| Townships, 2nd Class: |  | Boroughs:             |  | 419 SILVERDALE        |  | 202 ALLEGHENY         |  | 202 ALLEGHENY         |  |
| 203 AMITY             |  | 401 ALBA              |  | 420 TRUMBAUERSVILLE   |  | 203 BRADY             |  | 203 BARR              |  |
| 204 BERN              |  | 402 ATHENS            |  | 421 TULLYTOWN         |  | 204 BUFFALO           |  | 204 BLACKLICK         |  |
| 205 BETHEL            |  | 403 BURLINGTON        |  | 422 YARDLEY           |  | 205 CENTER            |  | 205 CAMBRIA           |  |
| 206 BRECKNOCK         |  | 404 CANTON            |  | Townships, 1st Class: |  | 206 CHERRY            |  | 206 CHEST             |  |
| 207 CAERNARVON        |  | 405 LERAYSVILLE       |  | 101 BRISTOL           |  | 207 CLAY              |  | 207 CLEARFIELD        |  |
| 208 CENTRE            |  | 406 MONROE            |  | Townships, 2nd Class: |  | 208 CLEARFIELD        |  | 208 CONEMAUGH         |  |
| 211 DISTRICT          |  | 407 NEW ALBANY        |  | 201 BEDMINSTER        |  | 209 CLINTON           |  | 209 CRESSON           |  |
| 212 DOUGLASS          |  | 408 ROME              |  | 202 BENSELEM          |  | 210 CONCORD           |  | 210 CROYLE            |  |
| 213 EARL              |  | 409 SAYRE             |  | 203 BRIDGETON         |  | 211 CONNOQUENESSING   |  | 211 DEAN              |  |
| 214 EXETER            |  | 410 SOUTH WAVERLY     |  | 204 BUCKINGHAM        |  | 212 CRANBERRY         |  | 212 EAST CARROLL      |  |
| 215 GREENWICH         |  | 411 SYLVANIA          |  | 205 DOYLESTOWN        |  | 213 DONEGAL           |  | 213 EAST TAYLOR       |  |
| 216 HEIDELBERG        |  | 412 TOWANDA           |  | 206 DURHAM            |  | 214 FAIRVIEW          |  | 214 ELDER             |  |
| 217 HEREFORD          |  | 413 TROY              |  | 207 EAST ROCKHILL     |  | 215 FORWARD           |  | 215 GALLITZIN         |  |
| 218 JEFFERSON         |  | 414 WYALUSING         |  | 208 FALLS             |  | 216 FRANKLIN          |  | 216 JACKSON           |  |
| 219 LONGSWAMP         |  | Townships, 2nd Class: |  | 209 HAYCOCK           |  | 217 JACKSON           |  | 217 LOWER YODER       |  |
| 220 LOWER ALSACE      |  | 201 ALBANY            |  | 210 HILLTOWN          |  | 218 JEFFERSON         |  | 218 MIDDLE TAYLOR     |  |
| 221 LOWER HEIDELBER   |  | 202 ARMENIA           |  | 211 LOWER MAKEFIELD   |  | 219 LANCASTER         |  | 219 MUNSTER           |  |
| 222 MAIDEN CREEK      |  | 203 ASYLM             |  | 212 LOWER SOUTHAMPT   |  | 220 MARION            |  | 220 PORTAGE           |  |
| 223 MARION            |  | 204 ATHENS            |  | 213 MIDDLETOWN        |  | 221 MERCER            |  | 221 READE             |  |
| 224 MAXATAWNY         |  | 206 BURLINGTON        |  | 214 MILFORD           |  | 222 MIDDLESEX         |  | 222 RICHLAND          |  |
| 226 NORTH HEIDELBER   |  | 207 CANTON            |  | 215 NEW BRITAIN       |  | 223 MUDDY CREEK       |  | 223 SUMMERHILL        |  |
| 227 OLEY              |  | 208 COLUMBIA          |  | 216 NEWTON            |  | 224 OAKLAND           |  | 224 SUSQUEHANNA       |  |
| 228 ONTELAUNEE        |  | 209 FRANKLIN          |  | 217 NOCKAMIXON        |  | 225 PARKER            |  | 225 UPPER YODER       |  |
| 229 PENN              |  | 210 GRANVILLE         |  | 218 NORTHAMPTON       |  | 226 PENN              |  | 226 WASHINGTON        |  |
| 230 PERRY             |  | 211 HERRICK           |  | 219 PLUMSTEAD         |  | 227 SLIPPERY ROCK     |  | 227 WEST CARROLL      |  |
| 231 PIKE              |  | 212 LEROY             |  | 220 RICHLAND          |  | 228 SUMMIT            |  | 228 WEST TAYLOR       |  |
| 232 RICHMOND          |  | 213 LITCHFIELD        |  | 221 SOLEBURY          |  | 229 VENANGO           |  | 229 WHITE             |  |
| 233 ROBESON           |  | 214 MONROE            |  | 222 SPRINGFIELD       |  | 230 WASHINGTON        |  | <b>CAMERON - 12</b>   |  |
| 234 ROCKLAND          |  | 215 NORTH TOWANDA     |  | 223 TINICUM           |  | 231 WINFIELD          |  | District 02-0         |  |
| 235 RUSCOMBMANOR      |  | 216 ORWELL            |  | 224 UPPER MAKEFIELD   |  | 232 WORTH             |  | Boroughs:             |  |
| 236 SOUTH HEIDELBER   |  | 217 OVERTON           |  | 225 UPPER SOUTHAMPT   |  | <b>CAMBRIA - 11</b>   |  | 401 DRIFTWOOD         |  |
| 237 SPRING            |  | 218 PIKE              |  | 226 WARMINSTER        |  | District 09-0         |  | 402 EMPORIUM          |  |
| 238 TILDEN            |  | 219 RIDGEBURY         |  | 227 WARRINGTON        |  | Cities:               |  | Townships, 2nd Class: |  |
| 239 TULPEHOCKEN       |  | 220 ROME              |  | 228 WARWICK           |  | 301 JOHNSTOWN         |  | 201 GIBSON            |  |
| 240 UNION             |  | 221 SHESHEQUIN        |  | 229 WEST ROCKHILL     |  | 301 BUTLER            |  | 202 GROVE             |  |
| 241 UPPER BERN        |  | 222 SMITHFIELD        |  | 230 WRIGHTSTOWN       |  | Boroughs:             |  | 203 LUMBER            |  |
| 242 UPPER TULPEHOCK   |  | 223 SOUTH CREEK       |  | BUTLER - 10           |  | 401 ASHVILLE          |  | 204 PORTAGE           |  |
| 243 WASHINGTON        |  | 224 SPRINGFIELD       |  | District 10-0         |  | 402 BARNESBORO        |  | 205 SHIPPEN           |  |
| 244 WINDSOR           |  | 225 STANDING STONE    |  | Cities:               |  | 403 BROWNSTOWN        |  | <b>CARBON - 13</b>    |  |
| <b>BLAIR - 07</b>     |  | 226 STEVENS           |  | 404 CARROLLTOWN       |  | 405 CASSANDRA         |  | District 05-0         |  |
| District 09-0         |  | 227 TERRY             |  | 405 EAST CONEMAUGH    |  | 406 CHEST SPRINGS     |  | Boroughs:             |  |
| Cities:               |  | 228 TOWANDA           |  | 407 CRESSON           |  | 407 CRENSON           |  | 401 BEAVER MEADOWS    |  |
| 301 ALTOONA           |  | 229 TROY              |  | 408 DAISYTOWN         |  | 408 DAISYTOWN         |  | 402 BOWMANSTOWN       |  |
| Boroughs:             |  | 230 TUSCARORA         |  | 409 DALE              |  | 409 DALE              |  | 403 EAST SIDE         |  |
| 401 BELLWOOD          |  | 231 ULSTER            |  | 410 EAST CONEMAUGH    |  | 410 EAST CONEMAUGH    |  | 404 JIM THORPE        |  |
| 402 DUNCANSVILLE      |  | 232 WARREN            |  | 411 EBENSBURG         |  | 411 EBENSBURG         |  | 405 LANSFORD          |  |
| 403 HOLLIDAYSBURG     |  | 233 WELLS             |  | 412 EHRENFELD         |  | 412 EHRENFELD         |  | 406 LEHIGHTON         |  |
| 404 MARTINSBURG       |  | 234 WEST BURLINGTON   |  | 413 FERNDALE          |  | 413 FERNDALE          |  | 407 PALMERTON         |  |
| 405 NEWRY             |  | 235 WILMOT            |  | 414 EAU CLAIRE        |  | 414 FRANKLIN          |  | 408 PARRYVILLE        |  |
| 406 ROARING SPRING    |  | 236 WINDHAM           |  | 415 EVANS CITY        |  | 415 GALLITZIN         |  | 409 SUMMIT HILL       |  |
| 407 TYRONE            |  | 237 WYALUSING         |  | 416 FAIRVIEW          |  | 416 GEISTOWN          |  | 410 WEATHERLY         |  |
| 408 WILLIAMSBURG      |  | 238 WYSOX             |  | 417 HARMONY           |  | 417 HASTINGS          |  | 411 WEISSPORT         |  |
| Townships, 2nd Class: |  | <b>BUCKS - 09</b>     |  | 418 KARN'S CITY       |  | 418 LILLY             |  | 412 NESQUEHONING      |  |
| 201 ALLEGHENY         |  | District 06-0         |  | 419 MARS              |  | 419 LORAIN            |  | Townships, 2nd Class: |  |
| 202 ANTIS             |  | Boroughs:             |  | 420 LORETTO           |  | 420 LORETTO           |  | 201 BANKS             |  |
| 203 BLAIR             |  | 401 BRISTOL           |  | 421 NANTY GLO         |  | 421 NANTY GLO         |  | 202 EAST PENN         |  |
| 204 CATHARINE         |  | 402 CHALFONT          |  | 422 PATTON            |  | 422 PATTON            |  | 203 FRANKLIN          |  |
| 205 FRANKSTOWN        |  | 403 DOYLESTOWN        |  | 423 PORTAGE           |  | 423 PORTAGE           |  | 204 KIDDER            |  |
| 206 FREEDOM           |  | 404 DUBLIN            |  | 424 SANKERTOWN        |  | 424 SANKERTOWN        |  | 205 LAUSANNE          |  |
| 207 GREENFIELD        |  | 405 HULMEVILLE        |  | 425 SCALP LEVEL       |  | 425 SCALP LEVEL       |  | 206 LEHIGH            |  |
| 208 HUSTON            |  | 406 IVYLAND           |  | 426 SOUTH FORK        |  | 426 SOUTH FORK        |  | 207 LOWER TOWAMENSING |  |
| 209 JUNIATA           |  | 407 LANGHORNE         |  | 427 SOUTHMONT         |  | 427 SOUTHMONT         |  | 208 MAHONING          |  |
| 210 LOGAN             |  | 408 LANGHORNE MANOR   |  | 428 SPANGLER          |  | 428 SPANGLER          |  | 210 PACKER            |  |
| 211 NORTH WOODBURY    |  | 409 MORRISVILLE       |  | 429 SUMMERHILL        |  | 429 SUMMERHILL        |  | 211 PENN FOREST       |  |
| 212 SNYDER            |  | 410 NEW BRITAIN       |  | 430 TUNNEL HILL       |  | 430 TUNNEL HILL       |  | 212 TOWAMENSING       |  |
| 213 TAYLOR            |  | 411 NEW HOPE          |  | 431 VINTONDALE        |  | 431 VINTONDALE        |  | Townships, 1st Class: |  |
| 214 TYRONE            |  | 412 NEWTOWN           |  | 432 WESTMONT          |  | 432 WESTMONT          |  | 101 STONYCREEK        |  |
| 215 WOODBURY          |  | 413 PENNDEL           |  | 433 WILMORE           |  | 433 WILMORE           |  | 101 STONYCREEK        |  |
|                       |  | 414 PERKASIE          |  | 434 NORTHERN CAMBRI   |  | 434 NORTHERN CAMBRI   |  |                       |  |
|                       |  | 415 QUAKERTOWN        |  | Townships, 1st Class: |  | Townships, 1st Class: |  |                       |  |
|                       |  | 416 RICHLANDTOWN      |  | 101 BUTLER            |  | 101 BUTLER            |  |                       |  |

**APPENDIX B**  
**Coding for Item 5A06**

|                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>CENTRE - 14</b>    | 208 EAST GOSHEN<br>209 EAST MARLBOROUGH<br>210 EAST NANTMEAL<br>Boroughs:<br>401 BELLEFONTE<br>402 CENTRE HALL<br>403 HOWARD<br>404 MILESBURG<br>405 MILLHEIM<br>406 PHILIPSBURG<br>407 PORT MATILDA<br>408 SNOW SHOE<br>409 SOUTH PHILIPSBURG<br>410 STATE COLLEGE<br>411 UNIONVILLE                                                                                                                                                                                                                                                                                                                               | 211 MADISON<br>212 MILLCREEK<br>213 MONROE<br>214 PAINT<br>215 PERRY<br>216 PINNEY<br>217 PORTER<br>218 REDBANK<br>219 RICHLAND<br>220 SALEM<br>221 TOBY<br>222 WASHINGTON | Boroughs:<br>401 AVIS<br>402 BEECH CREEK<br>403 FLEMINGTON<br>404 LOGANTON<br>405 MILL HALL<br>406 RENOVO<br>407 SOUTH RENOVO                                                                                                                                                                                                                                                                                                                                  | Boroughs:<br>401 BLOOMING VALLEY<br>402 CAMBRIDGE SPRINGS<br>403 CENTERVILLE<br>404 COCHRANTON<br>405 CONNEAUT LAKE<br>406 CONNEAUTVILLE<br>407 HYDETOWN<br>408 LINESVILLE<br>409 SAEGERTOWN<br>410 SPARTANSBURG<br>411 SPRINGBORO<br>412 TOWNVILLE<br>413 VENANGO<br>414 WOODCOCK                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Townships, 2nd Class: | 225 NEW GARDEN<br>226 NEW LONDON<br>227 NEWLIN<br>228 NORTH COVENTRY<br>229 PENN<br>230 PENNSBURY<br>231 POCOPSON<br>232 SADSBURY<br>233 SCHUYLKILL<br>234 SOUTH COVENTRY<br>235 THORNBURY<br>236 TREDYFFRIN<br>237 UPPER OXFORD<br>238 UPPER UWCHLAN<br>239 UWCHLAN<br>240 VALLEY<br>241 WALLACE<br>242 WARWICK<br>243 WEST BRADFORD<br>244 WEST BRANDYWINE<br>245 WEST CALN<br>246 WEST FALLOWFIELD<br>247 WEST GOSHEN<br>248 WEST MARLBOROUGH<br>249 WEST NANTMEAL<br>250 WEST NOTTINGHAM<br>251 WEST PIKELAND<br>252 WEST SADSBURY<br>253 WEST VINCENT<br>254 WEST WHITELAND<br>255 WESTSTOWN<br>256 WILLISTOWN | <b>CLEARFIELD - 17</b><br>District 02-0                                                                                                                                    | Cities:<br>301 DUBOIS<br>Boroughs:<br>401 BRISBIN<br>402 BURNSIDE<br>403 CHESTER HILL<br>404 CLEARFIELD<br>405 COALPORT<br>406 CURWENSVILLE<br>407 GLEN HOPE<br>408 GRAMPIAN<br>409 HOUTZDALE<br>410 IRVONA<br>411 LUMBER CITY<br>412 MAHAFFEY<br>413 NEWBURG<br>414 NEW WASHINGTON<br>415 OSCEOLA MILLS<br>416 RAMEY<br>417 TROUTVILLE<br>418 WALLACETON<br>419 WESTOVER                                                                                      | Townships, 2nd Class:<br>201 ALLISON<br>202 BALD EAGLE<br>203 BEECH CREEK<br>204 CASTANEA<br>205 CHAPMAN<br>206 COLEBROOK<br>207 CRAWFORD<br>208 DUNNSTABLE<br>209 EAST KEATING<br>210 GALLAGHER<br>211 GREENE<br>212 GRUGAN<br>213 LAMAR<br>214 LEIDY<br>215 LOGAN<br>216 NOYES<br>217 PINE CREEK<br>218 PORTER<br>219 WAYNE<br>220 WEST KEATING<br>221 WOODWARD                                                                                | Townships, 2nd Class:<br>201 ATHENS<br>202 BEAVER<br>203 BLOOMFIELD<br>204 CAMBRIDGE<br>205 CONNEAUT<br>206 CUSSEWAGO<br>207 EAST FAIRFIELD<br>208 EAST FALLOWFIELD<br>209 EAST MEAD<br>210 FAIRFIELD<br>211 GREENWOOD<br>212 HAYFIELD<br>213 NORTH SHENANGO<br>214 OIL CREEK<br>215 PINE<br>216 RANDOLPH<br>217 RICHMOND<br>218 ROCKDALE<br>219 ROME<br>220 SADSBURY<br>221 SOUTH SHENANGO<br>222 SPARTA<br>223 SPRING<br>224 STEUBEN<br>225 SUMMERHILL<br>226 SUMMIT<br>227 TROY<br>228 UNION<br>229 VENANGO<br>230 VERNON<br>231 WAYNE<br>232 WEST FALLOWFIELD<br>233 WEST MEAD<br>234 WEST SHENANGO<br>235 WOODCOCK |
| <b>CHESTER - 15</b>   | District 06-0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <b>COLUMBIA - 19</b><br>District 03-0                                                                                                                                      | Boroughs:<br>401 BENTON<br>402 BERWICK<br>403 BRIAR CREEK<br>404 CATAWISSA<br>405 CENTRALIA<br>406 MILLVILLE<br>407 ORANGEVILLE<br>408 STILLWATER                                                                                                                                                                                                                                                                                                              | Townships, 2nd Class:<br>201 BEAVER<br>202 BENTON<br>203 BRIAR CREEK<br>204 CATAWISSA<br>205 CLEVELAND<br>206 CONYNGHAM<br>207 FISHING CREEK<br>208 FRANKLIN<br>209 GREENWOOD<br>210 HEMLOCK<br>211 JACKSON<br>212 LOCUST<br>213 MADISON<br>214 MAIN<br>215 MIFFLIN<br>216 MONTOUR<br>217 MT PLEASANT<br>218 NORTH CENTRE<br>219 ORANGE<br>220 PINE<br>221 ROARING CREEK<br>222 SCOTT<br>223 SOUTH CENTRE<br>224 SUGARLOAF                       | Townships, 2nd Class:<br>201 BEAVER<br>202 BENTON<br>203 BRIAR CREEK<br>204 CATAWISSA<br>205 CLEVELAND<br>206 CONYNGHAM<br>207 FISHING CREEK<br>208 FRANKLIN<br>209 GREENWOOD<br>210 HEMLOCK<br>211 JACKSON<br>212 LOCUST<br>213 MADISON<br>214 MAIN<br>215 MIFFLIN<br>216 MONTOUR<br>217 MT PLEASANT<br>218 NORTH CENTRE<br>219 ORANGE<br>220 PINE<br>221 ROARING CREEK<br>222 SCOTT<br>223 SOUTH CENTRE<br>224 SUGARLOAF                                                                                                                                                                                              |
| Cities:               | 301 COATESVILLE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <b>CLARION - 16</b><br>District 10-0                                                                                                                                       | Boroughs:<br>401 CALLensburg<br>402 CLARION<br>403 EAST BRADY<br>404 FOXBURG<br>405 HAWTHORNE<br>406 KNOX<br>407 NEW BETHLEHEM<br>408 RIMERSBURG<br>409 SAINT PETERSBURG<br>410 SHIPPENVILLE<br>411 SLIGO<br>412 STRATTANVILLE                                                                                                                                                                                                                                 | <b>CUMBERLAND - 21</b><br>District 08-0                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Boroughs:             | 401 ATGLENN<br>402 AVONDALE<br>403 DOWNTONTOWN<br>404 ELVERSON<br>405 HONEY BROOK<br>406 KENNEDY SQUARE<br>407 MALVERN<br>408 MODENA<br>409 OXFORD<br>410 PARKESBURG<br>411 PHOENIXVILLE<br>412 SOUTH COATESVILLE<br>413 SPRING CITY<br>414 WEST CHESTER<br>415 WEST GROVE                                                                                                                                                                                                                                                                                                                                          | Townships, 2nd Class:                                                                                                                                                      | Townships, 2nd Class:<br>201 BECCARIA<br>202 BELL<br>203 BIGLER<br>204 BLOOM<br>205 BOGGS<br>206 BRADFORD<br>207 BRADY<br>208 BURNSIDE<br>209 CHEST<br>210 COOPER<br>211 COVINGTON<br>212 DECATUR<br>213 FERGUSON<br>214 GIRARD<br>215 GOSHEN<br>216 GRAHAM<br>217 GREENWOOD<br>218 GULICH<br>219 HUSTON<br>220 JORDAN<br>221 KARTHAUS<br>222 KNOX<br>223 LAWRENCE<br>224 MORRIS<br>225 PENN<br>226 PIKE<br>227 PINE<br>228 SANDY<br>229 UNION<br>230 WOODWARD | Townships, 2nd Class:<br>201 BECCARIA<br>202 BELL<br>203 BIGLER<br>204 BLOOM<br>205 BOGGS<br>206 BRADFORD<br>207 BRADY<br>208 BURNSIDE<br>209 CHEST<br>210 COOPER<br>211 COVINGTON<br>212 DECATUR<br>213 FERGUSON<br>214 GIRARD<br>215 GOSHEN<br>216 GRAHAM<br>217 GREENWOOD<br>218 HUSTON<br>219 JORDAN<br>220 KARTHAUS<br>221 KNOX<br>222 LAWRENCE<br>223 MORRIS<br>224 PENN<br>225 PIKE<br>226 PINE<br>227 SANDY<br>228 UNION<br>229 WOODWARD |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Townships, 1st Class: | 101 CAIN                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <b>CLINTON - 18</b><br>District 02-0                                                                                                                                       | Cities:<br>301 LOCK HAVEN                                                                                                                                                                                                                                                                                                                                                                                                                                      | <b>CRAWFORD - 20</b><br>District 01-0                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Townships, 2nd Class: | 203 BRADY<br>204 CLARION<br>205 ELK<br>206 FARMINGTON<br>207 HIGHLAND<br>208 KNOX<br>209 LICKING<br>210 LIMESTONE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Townships, 2nd Class:                                                                                                                                                      | 301 MEADVILLE<br>302 TITUSVILLE                                                                                                                                                                                                                                                                                                                                                                                                                                | Townships, 1st Class:<br>101 EAST PENNSBORO<br>102 LOWER ALLEN<br>103 HAMPDEN<br>104 UPPER ALLEN                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Cities:                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Townships, 2nd Class:<br>201 COOKE<br>202 DICKINSON                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

**APPENDIX B**  
**Coding for Item 5A06**

|                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                          |
|-------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| <b>CUMBERLAND - 21 (cont)</b> | Boroughs:                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <b>ERIE - 25</b>                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                          |
| District 08-0                 | 401 ALDAN<br>402 BROOKHAVEN<br>403 CHESTER HEIGHTS<br>404 CLIFTON HEIGHTS<br>405 COLLINGDALE<br>406 COLWYN<br>407 DARBY<br>408 EAST LANSDOWNE<br>409 EDDYSTONE<br>410 FOLCROFT<br>411 GLENOLDEN<br>412 LANSDOWNE<br>413 MARCUS HOOK<br>414 MEDIA<br>415 MILLBOURNE<br>416 MORTON<br>417 NORWOOD<br>418 PARKSIDE<br>419 PROSPECT PARK<br>420 RIDLEY PARK<br>421 ROSE VALLEY<br>422 RUTLEDGE<br>423 SHARON HILL<br>424 SWARTHMORE<br>425 TRAINER<br>426 UPLAND<br>427 YEADON | District 01-0<br>Cities:<br>301 CORRY<br>302 ERIE<br>Boroughs:<br>401 ALBION<br>402 CRANESVILLE<br>404 EDINBORO<br>405 ELGIN<br>407 GIRARD<br>408 LAKE CITY<br>409 MCKEAN<br>410 MILL VILLAGE<br>411 NORTH EAST<br>412 PLATEA<br>413 UNION CITY<br>414 WATERFORD<br>415 WATTSBURG<br>416 WESLEYVILLE   | 204 DUNBAR<br>205 FRANKLIN<br>206 GEORGES<br>207 GERMAN<br>208 HENRY CLAY<br>209 JEFFERSON<br>210 LOWER TYRONE<br>211 LUZERNE<br>212 MENALLEN<br>213 NICHOLSON<br>214 NORTH UNION<br>215 PERRY<br>216 REDSTONE<br>217 SALTICK<br>218 SOUTH UNION<br>219 SPRINGFIELD<br>220 SPRINGHILL<br>221 STEWART<br>222 UPPER TYRONE<br>223 WASHINGTON<br>224 WHARTON         | 205 DUBLIN<br>206 LICKING CREEK<br>207 TAYLOR<br>208 THOMPSON<br>209 TODD<br>210 UNION<br>211 WELLS                                      |
| Townships, 2nd Class:         | 203 HOPEWELL<br>204 LOWER FRANKFORD<br>205 LOWER MIFFLIN<br>206 MIDDLESEX<br>207 MONROE<br>208 NORTH MIDDLETON<br>209 NORTH NEWTON<br>210 PENN<br>211 SHIPPENSBURG<br>212 SILVER SPRING<br>213 SOUTH MIDDLETON<br>214 SOUTH NEWTON<br>215 SOUTHAMPTON<br>217 UPPER FRANKFORD<br>218 UPPER MIFFLIN<br>219 WEST PENNSBORO                                                                                                                                                    |                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                          |
| <b>DAUPHIN - 22</b>           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                   | <b>GREENE - 30</b>                                                                                                                       |
| District 08-0                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                   | District 12-0                                                                                                                            |
| Cities:                       | 301 HARRISBURG                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Townships, 1st Class:<br>101 LAWRENCE PARK                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                   | Boroughs:<br>401 CARMICHAELS<br>402 CLARKSVILLE<br>403 GREENSBORO<br>404 JEFFERSON<br>405 RICES LANDING<br>406 WAYNESBURG                |
| Boroughs:                     | 401 BERRYSBURG<br>402 DAUPHIN<br>403 ELIZABETHVILLE<br>404 GRATZ<br>405 HALIFAX<br>406 HIGHSPIRE<br>407 HUMMELSTOWN<br>408 LYKENS<br>409 MIDDLETOWN<br>410 MILLERSBURG<br>411 PAXTANG<br>412 PENBROOK<br>413 ROYALTON<br>414 STEELTON<br>415 PILLOW<br>416 WILLIAMSTOWN                                                                                                                                                                                                    | Townships, 1st Class:<br>101 ASTON<br>102 DARBY<br>103 HAVERFORD<br>104 LOWER CHICHESTE<br>105 NETHER PROVIDEN<br>106 RADNOR<br>107 RIDLEY<br>108 SPRINGFIELD<br>109 TINICUM<br>110 UPPER CHICHESTE<br>111 UPPER DARBY<br>112 MARPLE                                                                   | Townships, 2nd Class:<br>201 AMITY<br>202 CONCORD<br>203 CONNEAUT<br>204 ELK CREEK<br>205 FAIRVIEW<br>206 FRANKLIN<br>207 GIRARD<br>208 GREENE<br>209 GREENFIELD<br>210 HARBORCREEK<br>211 LE BOEUF<br>212 MCKEAN<br>213 MILLCREEK<br>214 NORTH EAST<br>215 SPRINGFIELD<br>216 SUMMIT<br>217 UNION<br>218 VENANGO<br>219 WASHINGTON<br>220 WATERFORD<br>221 WAYNE | Townships, 2nd Class:<br>201 BARNETT<br>202 GREEN<br>203 HARMONY<br>204 HICKORY<br>205 HOWE<br>206 JENKS<br>207 KINGSLEY<br>208 TIONESTA |
| Townships, 1st Class:         | 101 SUSQUEHANNA<br>102 SWATARA<br>103 LOWER SWATARA                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                          |
| Townships, 2nd Class:         | 201 BETHEL<br>202 CHADDS FORD<br>203 CHESTER<br>204 CONCORD<br>205 EDMONT<br>207 MIDDLETOWN                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                          |
| Townships, 2nd Class:         | 208 NEWTOWN<br>209 THORNBURY<br>210 UPPER PROVIDENC                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                          |
| <b>ELK - 24</b>               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <b>FAYETTE - 26</b>                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                          |
| District 02-0                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | District 12-0<br>Cities:<br>301 SAINT MARYS                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                          |
| Cities:                       | 301 SAINT MARYS                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 301 CONNELLSVILLE<br>302 UNIONTOWN                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                          |
| Boroughs:                     | 401 JOHNSONBURG<br>402 RIDGWAY                                                                                                                                                                                                                                                                                                                                                                                                                                             | Boroughs:<br>401 BELLE VERNON<br>402 BROWNSVILLE<br>403 DAWSON<br>404 DUNBAR<br>405 EVERSON<br>406 FAIRCHANCE<br>407 FAYETTE CITY<br>408 MARKLEYSBURG<br>409 MASONTOWN<br>410 NEWELL<br>411 OHIOPYLE<br>412 PERRYOPOLIS<br>413 POINT MARION<br>414 SMITHFIELD<br>415 SOUTH CONNELLSV<br>416 VANDERBILT |                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                          |
| Townships, 2nd Class:         | 201 BENEZETTE<br>203 FOX<br>204 HIGHLAND<br>205 HORTON<br>206 JAY<br>207 JONES<br>208 MILLSTONE<br>209 RIDGWAY<br>210 SPRING CREEK                                                                                                                                                                                                                                                                                                                                         | Townships, 2nd Class:<br>201 BROWNSVILLE<br>202 BULLSKIN<br>203 CONNELLSVILLE                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                          |
| <b>DELAWARE - 23</b>          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                          |
| District 06-0                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                          |
| Cities:                       | 301 CHESTER                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Townships, 2nd Class:<br>201 AYR<br>202 BELFAST<br>203 BETHEL<br>204 BRUSH CREEK                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                          |
|                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                          |

**APPENDIX B**  
**Coding for Item 5A06**

|                               |                        |                       |                    |                     |
|-------------------------------|------------------------|-----------------------|--------------------|---------------------|
| <b>HUNTINGDON - 31</b> (cont) | 407 REYNOLDSVILLE      | 416 VANDLING          | 223 MANOR          | 205 JACKSON         |
| District 09-0                 | 408 SUMMERVILLE        | 417 JESSUP            | 224 MARTIC         | 206 MILLCREEK       |
| Townships, 2nd Class:         | 409 SYKESVILLE         | Townships, 2nd Class: | 225 MOUNT JOY      | 207 NORTH ANNVILLE  |
| 214 LOGAN                     | 410 TIMBLIN            | 201 ABINGTON          | 226 PARADISE       | 208 NORTH CORNWALL  |
| 215 MILLER                    | 411 WORTHVILLE         | 202 BENTON            | 227 PENN           | 209 NORTH LEBANON   |
| 216 MORRIS                    | Townships, 2nd Class:  | 203 CARBONDALE        | 228 PEQUEA         | 210 NORTH LONDONDER |
| 217 ONEIDA                    | 201 BARNETT            | 204 CLIFTON           | 229 PROVIDENCE     | 211 SOUTH ANNVILLE  |
| 218 PENN                      | 202 BEAVER             | 205 COVINGTON         | 230 RAPHO          | 212 SOUTH LEBANON   |
| 219 PORTER                    | 203 BELL               | 206 ELMHURST          | 231 SADSBURY       | 213 SOUTH LONDONDER |
| 220 SHIRLEY                   | 204 CLOVER             | 207 FELL              | 232 SALISBURY      | 214 SWATARA         |
| 221 SMITHFIELD                | 205 ELDRED             | 208 GLENBURN          | 233 STRASBURG      | 215 UNION           |
| 222 SPRINGFIELD               | 206 GASKILL            | 209 GREENFIELD        | 234 UPPER LEACOCK  | 216 WEST CORNWALL   |
| 223 SPRUCE CREEK              | 207 HEATH              | 210 JEFFERSON         | 235 WARWICK        |                     |
| 224 TELL                      | 208 HENDERSON          | 211 LA PLUME          | 236 WEST COCALICO  | <b>LEHIGH - 39</b>  |
| 225 TODD                      | 209 KNOX               | 212 THORNHURST        | 237 WEST DONEGAL   | District 05-0       |
| 226 UNION                     | 210 MCCALMONT          | 213 MADISON           | 238 WEST EARL      | Cities:             |
| 227 WALKER                    | 211 OLIVER             | 214 NEWTON            | 239 WEST HEMPFIELD | 301 ALLEGHENY       |
| 228 WARRIORS MARK             | 212 PERRY              | 215 NORTH ABINGTON    | 240 WEST LAMPETER  | 302 BETHLEHEM       |
| 229 WEST                      | 213 PINE CREEK         | 216 RANSOM            |                    |                     |
| 230 WOOD                      | 214 POLK               | 217 ROARING BROOK     |                    |                     |
|                               | 215 PORTER             | 218 SCOTT             |                    |                     |
| <b>INDIANA - 32</b>           | 216 RINGGOLD           | 219 SOUTH ABINGTON    |                    |                     |
| District 10-0                 | 217 ROSE               | 220 SPRINGBROOK       |                    |                     |
| Boroughs:                     | 218 SNYDER             | 221 WEST ABINGTON     |                    |                     |
| 401 ARMAGH                    | 219 UNION              |                       |                    | Boroughs:           |
| 402 BLAIRSVILLE               | 220 WARSAW             |                       |                    | 401 ALBURTIS        |
| 403 CHERRY TREE               | 221 WASHINGTON         |                       |                    | 402 CATASAUQUA      |
| 404 CLYMER                    | 222 WINSLOW            |                       |                    | 403 COOPERSBURG     |
| 405 CREEKSIDE                 | 223 YOUNG              |                       |                    | 404 COPLAY          |
| 406 GLEN CAMPBELL             |                        |                       |                    | 405 EMMAUS          |
| 407 HOMER CITY                | <b>JUNIATA - 34</b>    |                       |                    | 406 FOUNTAIN HILL   |
| 408 INDIANA                   | District 02-0          |                       |                    | 407 MACUNGIE        |
| 410 MARION CENTER             | Boroughs:              |                       |                    | 408 SLATINGTON      |
| 411 PLUMVILLE                 | 401 MIFFLIN            | <b>LANCASTER - 36</b> |                    |                     |
| 412 SALTSBURG                 | 402 MIFFLINTOWN        | District 08-0         |                    |                     |
| 413 SHELOCTA                  | 403 PORT ROYAL         | Cities:               |                    |                     |
| 414 SMICKSBURG                | 404 THOMPSONTOWN       | 301 LANCASTER         |                    |                     |
| 415 ERNEST                    |                        | Boroughs:             |                    |                     |
| Townships, 2nd Class:         |                        | 401 ADAMSTOWN         |                    |                     |
| 201 ARMSTRONG                 |                        | 402 AKRON             |                    |                     |
| 202 BANKS                     |                        | 403 CHRISTIANA        |                    |                     |
| 203 BLACK LICK                |                        | 404 COLUMBIA          |                    |                     |
| 204 BRUSH VALLEY              |                        | 405 DENVER            |                    |                     |
| 205 BUFFINGTON                |                        | 406 EAST PETERSBURG   |                    |                     |
| 206 BURRELL                   |                        | 407 ELIZABETHTOWN     |                    |                     |
| 207 CANOE                     |                        | 408 EPHRATA           |                    |                     |
| 208 CENTER                    |                        | 409 LITITZ            |                    |                     |
| 209 CHERRYHILL                |                        | 410 MANHEIM           |                    |                     |
| 210 CONEMAUGH                 |                        | 411 MARIETTA          |                    |                     |
| 211 EAST MAHONING             |                        | 412 MILLERSVILLE      |                    |                     |
| 212 EAST WHEATFIELD           |                        | 413 MT JOY            |                    |                     |
| 213 GRANT                     | <b>LACKAWANNA - 35</b> | 414 MOUNTVILLE        |                    |                     |
| 214 GREEN                     | District 04-0          | 415 NEW HOLLAND       |                    |                     |
| 215 MONTGOMERY                | Cities:                | 416 QUARRYVILLE       |                    |                     |
| 216 NORTH MAHONING            | 301 CARBONDALE         | 417 STRASBURG         |                    |                     |
| 217 PINE                      | 302 SCRANTON           | 418 TERRE HILL        |                    |                     |
| 218 RAYNE                     |                        | Townships, 1st Class: |                    |                     |
| 219 SOUTH MAHONING            |                        | 101 MANHEIM           |                    |                     |
| 220 WASHINGTON                | Boroughs:              | 102 WILMINGTON        |                    |                     |
| 221 WEST MAHONING             | 401 ARCHBALD           |                       |                    | Cities:             |
| 222 WEST WHEATFIELD           | 402 BLAKELY            | 202 BRECKnock         |                    | 301 HAZLETON        |
| 223 WHITE                     | 403 CLARKS GREEN       | 203 CAERNARVON        |                    | 302 NANTICOKE       |
| 224 YOUNG                     | 404 CLARKS SUMMIT      | 204 CLAY              |                    | 303 PITTSSTON       |
|                               | 405 DALTON             | 205 COLERAIN          |                    | 304 WILKES BARRE    |
| <b>JEFFERSON - 33</b>         | 406 DICKSON CITY       | 206 CONESTOGA         |                    |                     |
| District 10-0                 | 407 DUNMORE            | 207 CONOY             |                    | Boroughs:           |
|                               | 408 JERMYN             | 208 DRUMORE           |                    | 401 ASHLEY          |
| Boroughs:                     | 409 MAYFIELD           | 209 EARL              |                    | 402 AVOCAS          |
| 401 BIG RUN                   | 410 MOOSIC             | 210 EAST COCALICO     |                    | 403 CONYNGHAM       |
| 402 BROCKWAY                  | 411 MOSCOW             | 211 EAST DONEGAL      |                    | 404 COURTDALE       |
| 403 BROOKVILLE                | 412 OLD FORGE          | 212 EAST DRUMORE      |                    | 405 DALLAS          |
| 404 CORSICA                   | 413 OLYPHANT           | 213 EAST EARL         |                    | 406 DUPONT          |
| 405 FALLS CREEK               | 414 TAYLOR             | 214 EAST HEMPFIELD    |                    | 407 DURYEA          |
| 406 PUNXSUTAWNEY              | 415 THROOP             | 215 EAST LAMPETER     |                    | 408 EDWARDSVILLE    |
|                               |                        | 216 EDEN              |                    | 409 EXETER          |
|                               |                        | 217 ELIZABETH         |                    | 410 FORTY FORT      |
|                               |                        | 218 EPHRATA           |                    | 411 FREELAND        |
|                               |                        | 219 FULTON            |                    | 412 HUGHESTOWN      |
|                               |                        | 220 LANCASTER         |                    | 413 JEDDO           |
|                               |                        | 221 LEACOCK           |                    | 414 KINGSTON        |
|                               |                        | 222 LITTLE BRITAIN    |                    | 415 LAFLIN          |
|                               |                        |                       |                    | 416 LARKSVILLE      |
|                               |                        |                       |                    | 417 LAUREL RUN      |
|                               |                        |                       |                    | 418 LUZERNE         |
|                               |                        |                       |                    | 419 NESCOPECK       |

**APPENDIX B**  
**Coding for Item 5A06**

|                            |                       |                       |                       |                         |
|----------------------------|-----------------------|-----------------------|-----------------------|-------------------------|
| <b>LUZERNE - 40 (cont)</b> | Townships, 2nd Class: | <b>MERCER - 43</b>    | 209 UNION             | 203 FRANCONIA           |
| District 04-0              | 201 ANTHONY           | District 01-0         | 210 WAYNE             | 204 HORSHAM             |
|                            | 202 ARMSTRONG         |                       |                       | 205 LIMERICK            |
| Boroughs:                  | 203 BASTRESS          | Cities:               | <b>MONROE - 45</b>    | 206 LOWER FREDERICK     |
| 420 NEW COLUMBUS           | 204 BRADY             | 301 FARRELL           | District 05-0         | 207 LOWER GWYNEDD       |
| 421 NUANGOLA               | 205 BROWN             | 302 SHARON            |                       | 208 LOWER PROVIDENC     |
| 422 PLYMOUTH               | 206 CASCADE           | 303 HERMITAGE         | Boroughs:             | 209 LOWER SALFORD       |
| 423 PRINGLE                | 207 CLINTON           |                       |                       | 210 MARLBOROUGH         |
| 424 SHICKSHINNY            | 208 COGAN HOUSE       | Boroughs:             | 401 DELAWARE WATER    | 211 MONTGOMERY          |
| 425 SUGAR NOTCH            | 209 CUMMINGS          | 401 CLARK             | 402 EAST STROUDSBUR   | 212 NEW HANOVER         |
| 426 SWOYERSVILLE           | 210 ELDRED            | 402 FREDONIA          | 403 MOUNT POCONO      | 213 PERKIOMEN           |
| 427 WARRIOR RUN            | 211 FAIRFIELD         | 403 GREENVILLE        | 404 STROUDSBURG       | 214 SALFORD             |
| 428 WEST HAZLETON          | 212 FRANKLIN          | 404 GROVE CITY        | Townships, 2nd Class: | 215 SKIPPACK            |
| 429 WEST PITTSSTON         | 213 GAMBLE            | 405 JACKSON CENTER    | 201 BARRETT           | 216 TOWAMENCIN          |
| 430 WEST WYOMING           | 214 HEPBURN           | 406 JAMESTOWN         | 202 CHESTNUTHILL      | 217 UPPER FREDERICK     |
| 431 WHITE HAVEN            | 215 JACKSON           | 407 MERCER            | 203 COOLBAUGH         | 219 UPPER HANOVER       |
| 432 WYOMING                | 216 JORDAN            | 408 NEW LEBANON       | 204 ELDRED            | 220 UPPER MERION        |
| 433 YATESVILLE             | 217 LEWIS             | 409 SANDY LAKE        | 205 HAMILTON          | 222 UPPER PROVIDENC     |
| 434 HARVEYS LAKE           | 218 LIMESTONE         | 410 SHARPSVILLE       | 206 JACKSON           | 223 UPPER SALFORD       |
| 435 PENN LAKE PARK         | 219 LOYALSOCK         | 411 SHEAKLEYVILLE     | 207 MIDDLE SMITHFIE   | 224 WHITEMARSH          |
| 436 BEAR CREEK VILL        | 220 LYCOMING          | 412 STONEBORO         | 208 PARADISE          | 225 WHITPAIN            |
|                            | 221 MCHENRY           | 413 WEST MIDDLESEX    | 209 POCONO            | 226 WORCESTER           |
| Townships, 1st Class:      | 222 MCINTYRE          | 414 WHEATLAND         | 210 POLK              |                         |
| 101 HANOVER                | 223 MCNETT            |                       | 211 PRICE             | <b>MONTOUR - 47</b>     |
| 102 NEWPORT                | 224 MIFFLIN           | Townships, 2nd Class: | 212 ROSS              | District 03-0           |
| 103 PLAINS                 | 225 MILL CREEK        | 201 COOLSPRING        | 213 SMITHFIELD        |                         |
| 104 WILKES BARRE           | 226 MORELAND          | 202 DEER CREEK        | 214 STROUD            | Boroughs:               |
|                            | 227 MUNCY             | 203 DELAWARE          | 215 TOBYHANNA         | 401 DANVILLE            |
| Townships, 2nd Class:      | 228 MUNCY CREEK       | 204 EAST LACKAWANNO   | 216 TUNKHANNOCK       | 402 WASHINGTONVILLE     |
| 201 BEAR CREEK             | 229 NIPPENOSE         | 205 FAIRVIEW          |                       | Townships, 2nd Class:   |
| 202 BLACK CREEK            | 230 OLD LYCOMING      | 206 FINDLEY           |                       | 201 ANTHONY             |
| 203 BUCK                   | 231 PENN              | 207 FRENCH CREEK      |                       | 202 COOPER              |
| 204 BUTLER                 | 232 PIATT             | 208 GREENE            |                       | 203 DERRY               |
| 205 CONYNGHAM              | 233 PINE              | 209 HEMPFIELD         |                       | 204 LIBERTY             |
| 206 DALLAS                 | 234 PLUNKETTS CREEK   | 210 JACKSON           |                       | 205 LIMESTONE           |
| 207 DENNISON               | 235 PORTER            | 211 JEFFERSON         |                       | 206 MAHONING            |
| 208 DORRANCE               | 236 SHREWSBURY        | 212 LACKAWANNOCK      |                       | 207 MAYBERRY            |
| 209 EXETER                 | 237 SUSQUEHANNA       | 213 LAKE              |                       | 208 VALLEY              |
| 210 FAIRMOUNT              | 238 UPPER FAIRFIELD   | 214 LIBERTY           |                       | 209 WEST HEMLOCK        |
| 211 FAIRVIEW               | 239 WASHINGTON        | 215 MILL CREEK        |                       |                         |
| 212 FOSTER                 | 240 WATSON            | 216 NEW VERNON        |                       | <b>NORTHAMPTON - 48</b> |
| 213 FRANKLIN               | 241 WOLF              | 217 OTTER CREEK       |                       | District 05-0           |
| 214 HAZLE                  | 242 WOODWARD          | 218 PERRY             |                       |                         |
| 215 HOLLENBACK             |                       | 219 PINE              |                       | Cities:                 |
| 216 HUNLOCK                |                       | 220 PYMATUNING        |                       | 301 BETHLEHEM           |
| 217 HUNTINGTON             |                       | 221 SALEM             |                       | 302 EASTON              |
| 218 JACKSON                |                       | 222 SANDY CREEK       |                       |                         |
| 219 JENKINS                | 301 BRADFORD          | 223 SANDY LAKE        |                       | Boroughs:               |
| 220 KINGSTON               |                       | 224 SHENANGO          |                       | 401 BANGOR              |
| 221 LAKE                   |                       | 225 SOUTH PYMATUNIN   |                       | 402 BATH                |
| 222 LEHMAN                 |                       | 226 SPRINGFIELD       |                       | 403 CHAPMAN QUARRIE     |
| 223 NESCOPECK              | 401 ELDRED            | 227 SUGAR GROVE       |                       | 404 EAST BANGOR         |
| 224 PITTSSTON              | 402 KANE              | 228 WEST SALEM        |                       | 405 FREEMANSBURG        |
| 225 PLYMOUTH               | 403 LEWIS RUN         | 229 WILMINGTON        |                       | 406 GLENDON             |
| 226 RICE                   | 404 MOUNT JEWETT      | 230 WOLF CREEK        |                       | 407 HELLERTOWN          |
| 227 ROSS                   | 405 PORT ALLEGANY     | 231 WORTH             |                       | 408 NAZARETH            |
| 228 SALEM                  | 406 SMETHPORT         |                       |                       | 409 NORTHAMPTON         |
| 229 SLOCUM                 |                       | <b>Mifflin - 44</b>   |                       | 410 NORTH CATASAUQUA    |
| 230 SUGARLOAF              |                       | District 02-0         |                       | 411 PEN ARGYL           |
| 231 UNION                  |                       | Boroughs:             |                       | 412 PORTLAND            |
| 232 WRIGHT                 |                       | 401 BURNHAM           |                       | 413 ROSETO              |
|                            |                       | 402 KISTLER           |                       | 414 STOCKERTOWN         |
| <b>LYCOMING - 41</b>       |                       | 403 LEWISTOWN         |                       | 415 TATAMY              |
| District 03-0              |                       | 404 MCVEYTOWN         |                       | 416 WALNUTPORT          |
| Cities:                    |                       | 405 NEWTON HAMILTON   |                       | 417 WEST EASTON         |
| 301 WILLIAMSPORT           |                       | 406 JUNIATA TERRACE   |                       | 418 WILSON              |
| Boroughs:                  |                       |                       |                       | 419 WIND GAP            |
| 401 DUBOISTOWN             | 210 LAFAYETTE         | Townships, 2nd Class: |                       |                         |
| 402 HUGHESVILLE            | 211 LIBERTY           | 201 ARMAGH            | 109 UPPER DUBLIN      | Townships, 1st Class:   |
| 403 JERSEY SHORE           | 212 NORWICH           | 202 BRATTON           | 110 UPPER MORELAND    | 101 BETHLEHEM           |
| 404 MONTGOMERY             | 213 OTTO              | 203 BROWN             | 111 WEST NORRITON     |                         |
| 405 MONTOURSVILLE          | 214 SERGEANT          | 204 DECATUR           | 112 WEST POTSGROVE    | Townships, 2nd Class:   |
| 406 MUNCY                  | 215 WETMORE           | 205 DERRY             | 113 UPPER GWYNEDD     | 201 ALLEN               |
| 407 PICTURE ROCKS          |                       | 206 GRANVILLE         | 114 UPPER POTSGROV    | 203 BUSHKILL            |
| 408 SALLADASBURG           |                       | 207 MENNO             |                       | 204 EAST ALLEN          |
| 409 SOUTH WILLIAMSP        |                       | 208 OLIVER            |                       | 205 FORKS               |
|                            |                       |                       |                       | 206 HANOVER             |

**APPENDIX B**  
**Coding for Item 5A06**

|                                                                                                                                                                                                      |                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>NORTHAMPTON - 48 (cont)</b>                                                                                                                                                                       | Townships, 2nd Class:                                                                                                                                                                                                 | 224 WEST BRANCH<br>225 WHARTON                                                                                                                                                                                                                                                                                                              | <b>SNYDER - 54</b>                                                                                                                                                                                                                                                                   | 220 SHADE<br>221 SOMERSET<br>222 SOUTHAMPTON<br>223 STONYCREEK<br>224 SUMMIT<br>225 UPPER TURKEYFOOT                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| District 05-0                                                                                                                                                                                        | 201 BUFFALO<br>202 CARROLL                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                             | District 03-0                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Townships, 2nd Class:                                                                                                                                                                                | 203 CENTRE<br>207 LEHIGH<br>208 LOWER MT BETHEL<br>209 LOWER NAZARETH<br>210 LOWER SAUCON<br>211 MOORE<br>212 PALMER<br>213 PLAINFIELD<br>214 UPPER MT BETHEL<br>215 UPPER NAZARETH<br>216 WASHINGTON<br>217 WILLIAMS | <b>SCHUYLKILL - 53</b>                                                                                                                                                                                                                                                                                                                      | Boroughs:                                                                                                                                                                                                                                                                            | 401 BEAVERTOWN<br>402 FREEBURG<br>403 MIDDLEBURG<br>404 SELINSGROVE<br>405 SHAMOKIN DAM<br>406 MCCLURE                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                                                                                                                                                                                                      | 204 GREENWOOD<br>205 HOWE<br>206 JACKSON<br>207 JUNIATA<br>208 LIVERPOOL<br>209 MILLER                                                                                                                                | District 05-0                                                                                                                                                                                                                                                                                                                               | Cities:                                                                                                                                                                                                                                                                              | 401 ASHLAND<br>402 AUBURN<br>403 COALDALE<br>404 CRESSONA<br>405 DEER LAKE<br>406 FRACKVILLE<br>407 GILBERTON<br>408 GIRARDVILLE<br>409 GORDON<br>410 LANDINGVILLE<br>411 MAHANOY CITY<br>412 MCADOO<br>413 MECHANICSVILLE<br>414 MIDDLEPORT<br>415 MINERSVILLE<br>416 MOUNT CARBON<br>417 NEW PHILADELPHIA<br>418 NEW RINGGOLD<br>419 ORWIGSBURG<br>420 PALO ALTO<br>421 PINE GROVE<br>422 PORT CARBON<br>423 PORT CLINTON<br>424 RINGTOWN<br>425 SAINT CLAIR<br>426 SCHUYLKILL HAVEN<br>427 SHENANDOAH<br>428 TAMAQUA<br>429 TOWER CITY<br>430 TREMONT |                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>NORTHUMBERLAND - 49</b>                                                                                                                                                                           | 216 SPRING<br>217 TOBOYNE<br>218 TUSCARORA                                                                                                                                                                            | District 04-0                                                                                                                                                                                                                                                                                                                               | Townships, 2nd Class:                                                                                                                                                                                                                                                                | 201 ADAMS<br>202 BEAVER<br>203 CENTRE<br>204 CHAPMAN<br>205 FRANKLIN<br>206 JACKSON<br>207 MIDDLE CREEK<br>208 MONROE<br>209 PENN<br>210 PERRY<br>211 SPRING<br>212 UNION<br>213 WASHINGTON<br>214 WEST BEAVER<br>215 WEST PERRY                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| District 03-0                                                                                                                                                                                        | 219 TYRONE<br>301 SHAMOKIN<br>302 SUNBURY                                                                                                                                                                             | Cities:                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Cities:                                                                                                                                                                                              | 220 WATTS<br>221 WHEATFIELD                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Boroughs:                                                                                                                                                                                            | <b>PIKE - 51</b>                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                             | <b>SOMERSET - 55</b>                                                                                                                                                                                                                                                                 | <b>SUSQUEHANNA - 57</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 401 HERNDON<br>402 KULPMONT<br>403 MARION HEIGHTS<br>404 MCEWENSVILLE<br>405 MILTON<br>406 MOUNT CARMEL<br>407 NORTHUMBERLAND                                                                        | District 04-0                                                                                                                                                                                                         | Boroughs:                                                                                                                                                                                                                                                                                                                                   | District 09-0                                                                                                                                                                                                                                                                        | District 04-0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 408 RIVERSIDE<br>409 SNYDERTOWN<br>410 TURBOTVILLE<br>411 WATSONTOWN                                                                                                                                 | 201 MATAMORAS<br>402 MILFORD                                                                                                                                                                                          | 415 MINERSVILLE<br>416 MOUNT CARBON<br>417 NEW PHILADELPHIA<br>418 NEW RINGGOLD<br>419 ORWIGSBURG<br>420 PALO ALTO<br>421 PINE GROVE<br>422 PORT CARBON<br>423 PORT CLINTON<br>424 RINGTOWN<br>425 SAINT CLAIR<br>426 SCHUYLKILL HAVEN<br>427 SHENANDOAH<br>428 TAMAQUA<br>429 TOWER CITY<br>430 TREMONT                                    | Boroughs:                                                                                                                                                                                                                                                                            | Boroughs:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Townships, 1st Class:                                                                                                                                                                                | 205 LACKAWAXEN                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                      | 401 FOREST CITY<br>402 FRIENDSVILLE<br>403 GREAT BEND<br>404 HALLSTEAD<br>405 HOP BOTTOM<br>406 LANESBORO<br>407 LITTLE MEADOWS<br>408 MONROE<br>409 NEW MILFORD<br>410 OAKLAND<br>411 SUSQUEHANNA DEP<br>412 THOMPSON<br>413 UNION DALE                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 101 COAL                                                                                                                                                                                             | 206 LEHMAN<br>207 MILFORD<br>208 PALMYRA                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Townships, 2nd Class:                                                                                                                                                                                | 209 PORTER                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 201 DELAWARE<br>202 EAST CAMERON<br>203 EAST CHILLISQUA                                                                                                                                              | 210 SHOHOLA<br>211 WESTFALL                                                                                                                                                                                           | Townships, 2nd Class:                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                      | Townships, 2nd Class:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 204 JACKSON<br>205 JORDAN<br>206 LEWIS<br>207 LITTLE MAHANOY<br>208 LOWER AUGUSTA<br>209 LOWER MAHANOY<br>210 MOUNT CARMEL<br>211 POINT<br>212 RALPHO<br>213 ROCKEFELLER<br>214 RUSH<br>215 SHAMOKIN | POTTER - 52                                                                                                                                                                                                           | 201 BARRY<br>202 BLYTHE<br>203 BRANCH<br>204 BUTLER<br>205 CASS<br>206 DELANO<br>207 EAST BRUNSWICK<br>208 EAST NORWEGIAN<br>209 EAST UNION<br>210 ELDRED<br>211 FOSTER<br>212 FRAILEY<br>213 HEGINS<br>214 HUBLEY<br>215 KLINE<br>216 MAHANOY<br>217 NEW CASTLE<br>218 NORTH MANHEIM<br>219 NORTH UNION<br>220 NORWEGIAN<br>221 PINE GROVE | 410 ADDISON<br>411 MEYERSDALE<br>412 NEW BALTIMORE<br>413 NEW CENTERVILLE<br>414 PAINT<br>415 ROCKWOOD<br>416 SALISBURY<br>417 SHANKSVILLE<br>418 SOMERSET<br>419 STOYSTOWN<br>420 URSINA<br>421 WELLERSBURG<br>422 WINDBER<br>423 SEVEN SPRINGS<br>424 INDIAN LAKE<br>425 CALLIMONT | 401 ADDISON<br>410 JENNERSTOWN<br>411 MEYERSDALE<br>412 NEW BALTIMORE<br>413 NEW CENTERVILLE<br>414 PAINT<br>415 ROCKWOOD<br>416 SALISBURY<br>417 SHANKSVILLE<br>418 SOMERSET<br>419 STOYSTOWN<br>420 URSINA<br>421 WELLERSBURG<br>422 WINDBER<br>423 SEVEN SPRINGS<br>424 INDIAN LAKE<br>425 CALLIMONT                                                                                                                                                                                                                                                  | 201 APOLACON<br>202 ARARAT<br>203 AUBURN<br>204 BRIDGEWATER<br>205 BROOKLYN<br>206 CHOCONUT<br>207 CLIFFORD<br>208 DIMOCK<br>209 FOREST LAKE<br>210 FRANKLIN<br>211 GIBSON<br>212 GREAT BEND<br>213 HARFORD<br>214 HARMONY<br>215 HERRICK<br>216 JACKSON<br>217 JESSUP<br>218 LATHROP<br>219 LENOX<br>220 LIBERTY<br>221 MIDDLETOWN<br>222 NEW MILFORD<br>223 OAKLAND<br>224 RUSH<br>225 SILVER LAKE<br>226 SPRINGVILLE<br>227 THOMPSON |
| 216 TURBOT<br>217 UPPER AUGUSTA<br>218 UPPER MAHANOY<br>219 WASHINGTON<br>220 WEST CAMERON<br>221 WEST CHILLISQUA<br>222 ZERBE                                                                       | 201 ABBOTT<br>202 ALLEGANY<br>203 BINGHAM<br>204 CLARA<br>205 EAST FORK<br>206 EULALIA<br>207 GENESEE<br>208 HARRISON<br>209 HEBRON<br>210 HECTOR<br>211 HOMER<br>Boroughs:                                           | 201 BARRY<br>202 BLYTHE<br>203 BRANCH<br>204 BUTLER<br>205 CASS<br>206 DELANO<br>207 EAST BRUNSWICK<br>208 EAST NORWEGIAN<br>209 EAST UNION<br>210 ELDRED<br>211 FOSTER<br>212 FRAILEY<br>213 HEGINS<br>214 HUBLEY<br>215 KLINE<br>216 MAHANOY<br>217 NEW CASTLE<br>218 NORTH MANHEIM<br>219 NORTH UNION<br>220 NORWEGIAN<br>221 PINE GROVE | Townships, 2nd Class:                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| District 08-0                                                                                                                                                                                        | 212 KEATING<br>401 BLAIN<br>402 BLOOMFIELD<br>403 DUNCANNON<br>404 LANDISBURG<br>405 LIVERPOOL<br>406 MARYSVILLE<br>407 MILLERSTOWN<br>408 NEW BUFFALO<br>409 NEWPORT                                                 | 213 OSWAYO<br>214 PIKE<br>215 PLEASANT VALLEY<br>216 PORTAGE<br>217 ROULETTE<br>218 SHARON<br>219 STEWARDSON<br>220 SUMMIT<br>221 SWEDEN<br>222 SYLVANIA<br>223 ULYSSES                                                                                                                                                                     | 222 PORTER<br>224 REILLY<br>225 RUSH<br>226 RYAN<br>227 SCHUYLKILL<br>228 SOUTH MANHEIM<br>229 TREMONT<br>230 UNION<br>231 UPPER MAHANTANG<br>232 WALKER<br>233 WASHINGTON<br>234 WAYNE<br>235 WEST BRUNSWICK<br>236 WEST MAHANOY<br>237 WEST PENN                                   | Townships, 2nd Class:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                                                                                                                                                                                                      |                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                         |

**APPENDIX B**  
**Coding for Item 5A06**

|                       |                       |                      |                       |                       |
|-----------------------|-----------------------|----------------------|-----------------------|-----------------------|
| <b>TIOGA - 58</b>     | 404 PLEASANTVILLE     | 406 CANONSBURG       | Townships, 2nd Class: | Townships, 1st Class: |
| District 03-0         | 405 POLK              | 407 CENTERVILLE      | 201 BERLIN            | 101 NORTH HUNTINGDON  |
|                       | 406 ROUSEVILLE        | 408 CHARLEROI        | 202 BUCKINGHAM        | 102 PENN              |
| Boroughs:             | 407 UTICA             | 409 CLAYSVILLE       | 203 CANAAN            | 103 ROSTRAVER         |
| 401 BLOSSBURG         | 408 BARKEYVILLE       | 410 COAL CENTER      | 204 CHERRY RIDGE      | Townships, 2nd Class: |
| 402 ELKKLAND          | 409 SUGARCREEK        | 411 COKEBURG         | 205 CLINTON           | 201 ALLEGHENY         |
| 403 KNOXVILLE         |                       | 412 DEEMSTON         | 206 DAMASCUS          | 202 BELL              |
| 404 LAWRENCEVILLE     | Townships, 2nd Class: | 413 DONORA           | 207 DREHER            | 203 COOK              |
| 405 LIBERTY           | 201 ALLEGHENY         | 414 DUNLEVY          | 208 DYBERRY           | 204 DERRY             |
| 406 MANSFIELD         | 202 CANAL             | 415 EAST WASHINGTON  | 209 LAKE              | 205 DONEGAL           |
| 407 ROSEVILLE         | 203 CHERRYTREE        | 416 ELCO             | 210 LEBANON           | 206 EAST HUNTINGTON   |
| 408 TIOGA             | 204 CLINTON           | 417 ELLSWORTH        | 211 LEHIGH            | 207 FAIRFIELD         |
| 409 WELLSBORO         | 205 CORNPLANTER       | 418 FINLEYVILLE      | 212 MANCHESTER        | 209 HEMPFIELD         |
| 410 WESTFIELD         | 206 CRANBERRY         | 419 HOUSTON          | 213 MOUNT PLEASANT    | 210 LIGONIER          |
|                       | 207 FRENCH CREEK      | 420 LONG BRANCH      | 214 OREGON            | 211 LOYALHANNA        |
| Townships, 2nd Class: | 208 IRWIN             | 421 MARIANNA         | 215 PALMYRA           | 212 MOUNT PLEASANT    |
| 201 BLOSS             | 209 JACKSON           | 422 MCDONALD         | 216 PAUPACK           | 213 ST CLAIR          |
| 202 BROOKFIELD        | 210 MINERAL           | 423 MIDWAY           | 217 PRESTON           | 214 SALEM             |
| 203 CHARLESTON        | 211 OAKLAND           | 424 NEW EAGLE        | 218 SALEM             | 215 SEWICKLEY         |
| 204 CHATHAM           | 212 OIL CREEK         | 425 NORTH CHARLEROI  | 219 SCOTT             | 216 SOUTH HUNTINGDON  |
| 205 CLYMER            | 213 PINE GROVE        | 426 ROSCOE           | 220 SOUTH CANAAN      | 217 UNITY             |
| 206 COVINGTON         | 214 PLUM              | 427 SPEERS           | 221 STERLING          | 218 UPPER BURRELL     |
| 207 DEERFIELD         | 215 PRESIDENT         | 428 STOCKDALE        | 222 TEXAS             | 219 WASHINGTON        |
| 208 DELMAR            | 216 RICHLAND          | 429 TWILIGHT         |                       |                       |
| 209 DUNCAN            | 217 ROCKLAND          | 430 WEST ALEXANDER   |                       |                       |
| 210 ELK               | 218 SANDY CREEK       | 431 WEST BROWNSVILLE |                       |                       |
| 212 FARMINGTON        | 219 SCRUBGRASS        | 432 WEST MIDDLETOWN  |                       |                       |
| 213 GAINES            | 220 VICTORY           | 433 GREENHILLS       |                       |                       |
| 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         |                       |                      |                       |                       |
| <b>UNION - 59</b>     |                       |                      |                       |                       |
| District 03-0         |                       |                      |                       |                       |
| Boroughs:             |                       |                      |                       |                       |
| 401 HARTLETON         |                       |                      |                       |                       |
| 402 LEWISBURG         |                       |                      |                       |                       |
| 403 MIFFLINBURG       |                       |                      |                       |                       |
| 404 NEW BERLIN        |                       |                      |                       |                       |
| Townships, 2nd Class: |                       |                      |                       |                       |
| 201 BUFFALO           | 215 PINE GROVE        | 223 ROBINSON         | 420 NORTH BELLE VER   | <b>YORK - 66</b>      |
| 202 EAST BUFFALO      | 216 PITTSFIELD        | 224 SMITH            | 421 NORTH IRWIN       | District 12-0         |
| 203 GREGG             | 217 PLEASANT          | 225 SOMERSET         | 422 OKLAHOMA          |                       |
| 204 HARTLEY           | 218 SHEFFIELD         | 226 SOUTH FRANKLIN   | 423 PENN              | Cities:               |
| 205 KELLY             | 219 SOUTHWEST         | 227 SOUTH STRABANE   | 424 SCOTTDALE         | 301 YORK              |
| 206 LEWIS             | 220 SPRING CREEK      | 228 UNION            | 425 SEWARD            |                       |
| 207 LIMESTONE         | 221 SUGAR GROVE       | 229 WEST BETHLEHEM   | 426 SMITHTON          | Boroughs:             |
| 208 UNION             | 222 TRIUMPH           | 230 WEST FINLEY      | 427 SOUTH GREENSBUR   | 401 CROSS ROADS       |
| 209 WEST BUFFALO      | 223 WATSON            | 231 WEST PIKE RUN    | 428 SOUTHWEST GREEN   | 402 DALLASTOWN        |
| 210 WHITE DEER        |                       |                      | 429 SUTERSVILLE       | 403 DELTA             |
| <b>VENANCO - 60</b>   |                       |                      | 430 TRAFFORD          | 404 DILLSBURG         |
| District 01-0         |                       |                      | 431 VANDERGRIFT       | 405 DOVER             |
| Cities:               |                       |                      | 432 WEST LEECHBURG    | 406 EAST PROSPECT     |
| 301 FRANKLIN          | 301 MONONGAHELA       | Boroughs:            | 433 WEST NEWTON       | 407 FAWN GROVE        |
| 302 OIL CITY          | 302 WASHINGTON        | 401 BETHANY          | 434 YOUNGSTOWN        | 408 FELTON            |
| Boroughs:             |                       | 402 HAWLEY           | 435 YOUNGWOOD         | 409 FRANKLINTOWN      |
| 401 CLINTONVILLE      |                       | 403 HONESDALE        | 436 NEW STANTON       | 410 GLEN ROCK         |
| 402 COOPERSTOWN       | 401 ALLENPORT         | 404 PROMPTON         | 437 MURRYSVILLE       | 411 GOLDSBORO         |
| 403 EMLENTON          | 402 BEALLSVILLE       | 405 STARRUCCA        | 438 LAUREL MOUNTAIN   | 412 HALLAM            |
|                       | 403 BENTLEYVILLE      | 406 WAYMART          |                       | 413 HANOVER           |
|                       | 404 BURGETTSTOWN      |                      |                       |                       |
|                       | 405 CALIFORNIA        |                      |                       |                       |

**APPENDIX B**  
**Coding for Item 5A06**

**YORK - 66 (cont)**

District 12-0

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 | Description                                                          | FHWA |
|---------|----------|----------------------------------------------------------------------|------|
| A01     | 5A01     | Structure Identification Number                                      | 5D   |
| A01     | 5A01     | Structure Identification Number                                      | 8    |
| A01     | VS13     | County Code                                                          |      |
| A01     | VS14     | State Route Number                                                   |      |
| A01     | VS15     | Segment Designation                                                  |      |
| A01     | VS16     | Offset                                                               |      |
| 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                                                  |      |
| A10     | 6A04     | County or Municipal Boundary Intersecting Bridge                     |      |
| A12     | 6A07     | Federal Funding Code                                                 |      |
| A12A    | VN01     | Design Exception                                                     |      |
| A13     | VM05     | PUC Docket Number                                                    |      |
| A14     | VN05     | Design Drawing Numbers                                               |      |
| A15     | VN06     | Shop Drawing Numbers                                                 |      |
| A16     | 5A15     | Year the Bridge Was Built                                            | 27   |
| A16     | VS09     | Year the Structure Was Built                                         |      |
| A16     | VW13     | Year the Wall Was Built                                              | 27   |
| A17     | 5A16     | Year of Last Major Reconstruction on the Bridge                      | 106  |
| A17     | VS10     | Year of Last Major Reconstruction on the Structure                   |      |
| A17     | VW14     | Year of Last Major Reconstruction on the Wall                        | 106  |
| 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   |
| A20     | VS32     | Owner or Principal Custodian of the Structure                        |      |
| A20     | VW33     | Owner or Principal Custodian of the Wall                             | 22   |
| A21     | VM01     | Legislative Act Number which Transferred Ownership                   |      |
| A22     | VM02     | Maintenance Responsibility for the Bridge                            |      |
| A22     | VS33     | Maintenance Responsibility for the Structure                         |      |
| A22     | VW34     | Maintenance Responsibility for the Wall                              |      |
| A23     | 5A20     | 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     | 5C07     | Critical Facility                                                    |      |
| 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     | Left Sidewalk Width                                                  | 50A  |
| A34     | VI08     | Right Sidewalk Width                                                 | 50B  |
| 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                                                   |      |
| B01     | 5C03     | Position/Prefix - Is the Feature Intersected On or Under the Bridge? |      |
| B01     |          | Not Used                                                             |      |
| B02     | 6C02     | State Roadway Location                                               | 5D   |

## APPENDIX C

### BMS to BMS2 Conversion Chart

| <b>BMSCode</b> | <b>BMS2Code</b> | <b>Description</b>                                                                                                          | <b>FHWA</b> |
|----------------|-----------------|-----------------------------------------------------------------------------------------------------------------------------|-------------|
| B02            | 6C03            | State Roadway Location                                                                                                      |             |
| B02            |                 | Not Used                                                                                                                    |             |
| 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            | 5E02            | Parallel Structure                                                                                                          |             |
| B10            | 6C25            | Median Type                                                                                                                 | 101         |
| B10            | 6C26            | Median Width                                                                                                                |             |
| B11            | 5A19            | Lanes Under the Structure                                                                                                   |             |
| B11            | 5C08            | Lanes On and Under the Structure / Medians on Structure / Spec                                                              | 28A         |
| B11            | FR07            | Total Number of Railroad Tracks                                                                                             |             |
| B11            | VS29            | Number of Lanes Under Sign Structure                                                                                        |             |
| 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         |
| B18            | 5C22            | Functional Classification                                                                                                   | 26          |
| B19            | 6C11            | State Highway Network                                                                                                       |             |
| B19A           | 5C33            | National Truck Network                                                                                                      | 110         |
| B20            | 4A19            | Minimum Lateral Underclearance on the Right Side                                                                            | 55          |
| 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                                                                             |             |
| B21            | FR13            | Total Horizontal Clearance for the Right Roadway                                                                            |             |
| B22            | 6C20            | Minimum Vertical Clearance for the Left Roadway                                                                             |             |
| B22            | 6C21            | Minimum Vertical Clearance for the Right Roadway                                                                            |             |
| B22            | FR10            | Minimum Vertical Clearance for the Left Roadway                                                                             |             |
| B22            | FR11            | Minimum Vertical Clearance for the Right Roadway                                                                            |             |
| B23            | 5C24            | 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          |
| B28            | 5C11            | Year of Average Daily Traffic                                                                                               | 30          |
| B29            | 6C27            | Average Daily Truck Traffic                                                                                                 | 109         |
| B30            | 6C28            | Year of Average Daily Truck Traffic                                                                                         |             |
| B30A           | 5C14            | Average Daily Truck Traffic (Percent)                                                                                       | 109         |
| B31            | 6C24            | Vertical Clearance Signing                                                                                                  |             |
| B32            | 5A07            | Features Intersected                                                                                                        | 6           |
| B33            | 5A08            | Facility Carried by Structure                                                                                               | 7           |
| B34            | 5A19            | Lanes Under the Structure                                                                                                   | 28B         |
| B34            | 5C08            | Lanes On and Under the Structure / Medians on Structure / Spec                                                              | 28A         |
| B34            | VS29            | Number of Lanes Under Sign Structure                                                                                        |             |
| 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            | 6A26            | Material Used for Main Unit, Approach Unit, Sign Structure and Walls (Department)                                           |             |
| C05            | 6A27            | Physical Makeup of Primary Load Carrying Members of Main 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                                                                                 |             |
| C06            | VD19            | Length of Culvert Barrel Along Its Centerline                                                                               |             |
| C07            | 5B18            | Structure Length                                                                                                            | 49          |
| C07            | 6A08            | Total Length of the Structure                                                                                               |             |
| C07A           | 5E01            | NBIS Bridge Length                                                                                                          | 112         |
| C08            | 5B17            | Maximum Span Length                                                                                                         | 48          |
| C09            | 6A38            | Bridge Deck Type                                                                                                            | 107         |
| C10            | 5B02            | Deck Surface Type (Main Span)                                                                                               | 108A        |

## APPENDIX C

### BMS to BMS2 Conversion Chart

| BMSCode | BMS2Code   | Description                                                                      | FHWA |
|---------|------------|----------------------------------------------------------------------------------|------|
| C10     | 5B03       | Deck Membrane Type                                                               | 108B |
| C10     | 5B04       | Deck Protection Type                                                             | 108C |
| C10     | 6A30       | Wearing Surface Type on Main and Approach Spans                                  | 108A |
| C10     | 6A31       | Type of Membrane Used for Main and Approach Spans                                | 108B |
| C10     | 6A32       | Type on Deck Corrosion Protection Used for Main and Approach Spans               | 108C |
| 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                                                                      |      |
| C17     | SP04       | Span Deck Width                                                                  |      |
| C18     | 6A44       | Fracture Critical Group Number for Main Unit and Approach Spans                  |      |
| C18A    | 6A45-6A48  | Critical Rating Factor Type of Member 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       | Latent Problems in 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                                             |      |
| C29     | VD11       | Prestressed Design Tensioning Method                                             |      |
| 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 Type                                                                      |      |
| 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       | Latent Problems in 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, IN23 | Calculated Scour Depth w/100 Year Flood, Calculated Scour Depth w/500 Year Flood |      |
| D13     | VP02       | Posting Status                                                                   | 41   |
| D14     | VP03       | Special Restrictive Posting                                                      |      |
| D15     | VP04       | Posted Weight Limit                                                              |      |

## APPENDIX C

### BMS to BMS2 Conversion Chart

| BMSCode | BMS2Code | Description                                                  | FHWA |
|---------|----------|--------------------------------------------------------------|------|
| 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   |
| E01     | IS13     | Frequency of Inspection of Sign Structure                    |      |
| E01     | IW13     | Frequency of Inspection of Wall Structure                    |      |
| E02     | 7A14     | Next Inspection Performed By                                 |      |
| E02A    | 6A10     | Flood Inspection                                             |      |
| E03     | VI12     | Special Equipment Type                                       |      |
| E04     | 6B01     | Type of Special Inspection That Is Needed                    | 92C  |
| E05     | 7A10     | Next Inspection Date                                         | 92C  |
| E05A    | VI02     | High Voltage Power Line                                      |      |
| E06     | 7A01     | Inspection Date                                              | 93C  |
| E06     | 7A01     | Inspection Date                                              | 90   |
| E07     | 7A03     | Primary Type of Inspection                                   |      |
| E07     | IS01     | Inspection Type for Sign 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                                |      |
| E21     | 1A05     | Channel and Channel Protection Condition Rating              |      |
| E22     | 1A03     | Culvert Condition Rating                                     |      |
| 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   |
| E28     | 4A02     | Approach Roadway Alignment Appraisal                         | 72   |
| E28A    | IA02     | Adequacy of Traffic Safety Features                          |      |
| E29     | 4B03     | Bridge Posting                                               |      |
| E29A    | 4A08     | Scour Critical Bridge Indicator                              | 113  |
| E30     | IR04     | Load Type                                                    |      |
| E30     | IR10     | Inventory Rating                                             | 66   |
| E31     | IR04     | Load Type                                                    |      |
| E31     | IR11     | Operating Rating                                             | 64   |
| E32     | IR06     | Rating Method                                                |      |
| 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 ASHTSO 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                                            |      |
| F03     |          | Not Used                                                     |      |
| F04     |          | Not Used                                                     |      |
| F05     | 3B03     | Improvement Length                                           | 76   |
| F06     |          | Not Used                                                     |      |
| F07     |          | Not Used                                                     |      |
| F08     |          | Not Used                                                     |      |

## APPENDIX C

### BMS to BMS2 Conversion Chart

| BMSCode | BMS2Code     | Description                                                            | FHWA |
|---------|--------------|------------------------------------------------------------------------|------|
| F09     |              | Not Used                                                               |      |
| F10     | 5C12         | Future Average Daily Traffic                                           | 114  |
| F11     | 5C13         | Year of Future Average Daily Traffic                                   | 115  |
| F12     |              | Not Used                                                               |      |
| F13     |              | Not Used                                                               |      |
| F14     |              | Not Used                                                               |      |
| F15     |              | Not Used                                                               |      |
| F16     |              | Not Used                                                               |      |
| F17     |              | Not Used                                                               |      |
| F18     |              | Not Used                                                               |      |
| 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                    |      |
| F24A    |              | Not Used                                                               |      |
| F25     |              | Not Used                                                               |      |
| F26     |              | Not Used                                                               |      |
| F27     |              | Not Used                                                               |      |
| G01     |              | Not Used                                                               |      |
| G02     |              | Not Used                                                               |      |
| G02     |              | Not Used                                                               |      |
| G03     | VN07         | Drawing Number for the Repair                                          |      |
| G04     | Project Plan |                                                                        |      |
| G04     |              | Not Used                                                               |      |
| G04     |              | Not Used                                                               |      |
| G05     | Project Plan |                                                                        |      |
| G05     |              | Not Used                                                               |      |
| G06     |              | Not Used                                                               |      |
| G07     | Project Plan |                                                                        |      |
| 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     | 3A06, IM03   | Action                                                                 |      |
| H02     | 3A06, IM03   | Action                                                                 |      |
| H03     | 3A03         | Structure Unit                                                         |      |
| H03     | 3A05, IM09   | Location                                                               |      |
| H04     | IM03         | Action                                                                 |      |
| H05     | 3A04, IM04   | Estimated Quantity                                                     |      |
| H06     | 3A07, IM10   | Estimated Cost                                                         |      |
| H07     |              | Not Used                                                               |      |
| H08     | 3A08, IM05   | Priority                                                               |      |
| H09     | 3A13, IM11   | Work Assignment                                                        |      |
| H10     | 3A09, IM06   | Date Recommended                                                       |      |
| H10A    |              | Not Used                                                               |      |
| H11     |              | Not Used                                                               |      |
| H12     | 3A11, IM08   | Target Year                                                            |      |
| J01     | 7A01         | Inspection Date                                                        |      |
| J02     | 6A44         | Fracture Critical Group Number for Main Unit and Approach Spans        |      |
| J03     | 6A45-6A48    | Critical Rating Factor Type of Member for Main Unit and Approach Spans |      |
| J04     | 6A49         | Total FCM Criticality 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        |      |
| J08     | 6A49         | Total FCM Criticality Ranking Factor for Main Unit and Approach Spans  |      |
| J09     | 5D02         | Structure Unit ID                                                      |      |
| J09     | 5D04         | Structure Unit Type                                                    |      |
| J09     | IF01         | FC Location                                                            |      |
| J10     | IF03         | Fracture Critical Member                                               |      |
| J11     | IF04         | Fracture Critical Detail                                               |      |
| J12     | IF05         | Fatigue Stress Category of the Fracture Critical Detail                |      |
| J13     | IF06         | Fracture Critical Member Detail Condition                              |      |

## APPENDIX C

### BMS to BMS2 Conversion Chart

| BMSCode  | BMS2Code     | Description                                                          | FHWA |
|----------|--------------|----------------------------------------------------------------------|------|
| L Screen | 2A01         | Structure Notes                                                      |      |
| 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                          |      |
| M06      | 6B41         | Eligibility of Bridge FCB Funds                                      |      |
| M07      |              | Not Used                                                             |      |
| M08      | 4A12         | Structurally Deficient or Functionally Obsolete Status               |      |
| 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           |      |
| M36      |              | Not Used                                                             |      |
| M37      |              | Not Used                                                             |      |
| N01      | IM14         | Date Completed                                                       |      |
| N02      | Project Plan |                                                                      |      |
| N05      | IM18         | Actual Quantity                                                      |      |
| N06      | IM19         | Actual Cost                                                          |      |
| N07      |              | Not Used                                                             |      |
| N08      |              | Not Used                                                             |      |
| O02      | AP07         | Engineering and Construction Management System (ECMS) Project Number |      |
| O03      |              | Not Used                                                             |      |
| O04      | AP01         | MPMS Project Number                                                  |      |
| O04      | AP15         | State Project Number                                                 |      |
| O05      | AP02         | Bridge Project Indicator                                             |      |
| O06      |              | Not Used                                                             |      |
| O07      | AP12         | Twelve Year Program Indicator - Construction Phase                   |      |
| O07      | AP13         | Twelve Year Program Indicator - Design Phase                         |      |
| O07      | AP14         | Twelve Year Program Indicator - ROW/Utility Phase                    |      |
| O08      |              | Not Used                                                             |      |
| O09      | AP03         | Bridge Bill Design Phase Indicator                                   |      |
| O09      | AP04         | Bridge Bill ROW/ Utilities Phase Indicator                           |      |
| O09      | AP05         | Bridge Bill Construction Phase Indicator                             |      |
| O10      | AP17         | Date of Construction Contract Letting                                |      |
| O11      | AP18         | Date of Construction Contract Award                                  |      |
| O12      | AP19         | Date of Notice to Proceed                                            |      |
| O13      | AP20         | Date of Project Completion                                           |      |
| O14      | AP21         | Date the Improved Structure Was Open to Traffic                      |      |
| O15      | AP22         | Date of Construction Acceptance Certificate                          |      |
| O16      |              | Not Used                                                             |      |
| O17      |              | Not Used                                                             |      |
| O18      | AP08         | Federal Aid Project Number                                           |      |
| O19      | AP23         | Study Costs                                                          |      |
| O19      | AP24         | Preliminary Design Costs                                             |      |
| O19      | AP25         | Right-Of-Way Costs                                                   |      |
| O19      | AP26         | Utilities Costs                                                      |      |
| O19      | AP27         | Final Design Costs                                                   |      |
| O19      | AP28         | Construction Costs                                                   |      |
| O19      | AP30         | Total Costs                                                          |      |
| O20      | AP23         | Study Costs                                                          |      |

## APPENDIX C

### BMS to BMS2 Conversion Chart

| BMSCode | BMS2Code | Description                                                          | FHWA |
|---------|----------|----------------------------------------------------------------------|------|
| O20     | AP24     | Preliminary Design Costs                                             |      |
| O20     | AP25     | Right-Of-Way Costs                                                   |      |
| O20     | AP26     | Utilities Costs                                                      |      |
| O20     | AP27     | Final Design Costs                                                   |      |
| O20     | AP28     | Construction Costs                                                   |      |
| O21     |          | Not Used                                                             |      |
| O22     |          | Not Used                                                             |      |
| PA01    | SS11     | APRAS Ref                                                            |      |
| PA02    | SS13     | Total APRAS Span                                                     |      |
| PA03    | SS12     | Axle Weight                                                          |      |
| PA04    | 5D02     | Structure Unit ID                                                    |      |
| PA04-1  | SS01     | Apras Span ID                                                        |      |
| PA04-1  | SS03     | Back Span Indicator                                                  |      |
| PA05    | SS04     | Identical Span No.                                                   |      |
| PA06    | SS06     | Continuous End Span                                                  |      |
| PA06    | SS06     | Continuous End Span                                                  |      |
| PA07    | 5D04     | Structure Unit Type                                                  |      |
| PA08    | SS07     | Center to Center Span Length                                         |      |
| PA09    | SP07     | Department Structure Type                                            |      |
| PA09    | SP08     | Department Structure Type                                            |      |
| PA09    | SP09     | Department Structure Type                                            |      |
| PA09    | SP10     | Department Structure Type                                            |      |
| PA09    | SS09     | Department Structure Type                                            |      |
| PA10    | SS08     | Moment Comparison Span Length                                        |      |
| PA11    | SL11     | Single Lane Span ID                                                  |      |
| 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 (Normal Traffic)                   |      |
| PB05    | SL07     | Positive Moment Comparison Factor Comment (Restricted Traffic)       |      |
| PB06    | SL08     | Negative Moment Comparison Factor (Normal Traffic)                   |      |
| PB06    | SL09     | Negative Moment Comparison Factor (Restricted Traffic)               |      |
| PB07    | SL10     | Load Conditions for the Permit                                       |      |
| PB07    | SL10     | Load Conditions for the Permit                                       |      |
| PB08    | 6C01     | State Roadway Location                                               |      |
| PB08    | 6C02     | State Roadway Location                                               |      |
| PB08    | 6C03     | State Roadway Location                                               |      |
| PB08    | 6C04     | State Roadway Location                                               |      |
| PB08    | SC02     | RMS Route                                                            |      |
| PB09    | 5C03     | Position/Prefix - Is the Feature Intersected On or Under the Bridge? |      |
| 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                                         |      |
| PC02    |          | Not Used                                                             |      |
| PC03    | SL17     | Controlling Member of the Span                                       |      |
| PC04    | SL18     | Year of Specifications Used in Determining Shear Ratings             |      |
| PC05    | SL20     | Percent Deterioration of the Controlling Member                      |      |
| PC06    | SL21     | Fatigue Stress Category of the Controlling Member / Detail           |      |
| PC07    | SL22     | Fatigue Stress Range                                                 |      |
| PC08    | SL01     | Date the Ratings Were Computed                                       |      |
| PC09-1  | SL24     | Load Analysis Method                                                 |      |
| PC09-2  | SL26     | Inventory Rating Load                                                |      |
| PC10-1  | SL24     | Load Analysis Method                                                 |      |
| PC10-2  | SL27     | Operating Rating Load                                                |      |
| PC11    | SL16     | Notes                                                                |      |
| PC12    | SL12     | Restricted Span ID (1)                                               |      |
| PC13    | SL13     | Restriction Codes 1,2, & 3                                           |      |
| PC13    | SL13     | Restriction Codes 1,2, & 3                                           |      |
| PC13    | SL13     | Restriction Codes 1,2, & 3                                           |      |
| PC14    | SL14     | Restricted Span ID (2)                                               |      |
| PC15    | SL15     | Restriction Code 4,5,6, & 7                                          |      |
| PC15    | SL15     | Restriction Code 4,5,6, & 7                                          |      |
| PC15    | SL15     | Restriction Code 4,5,6, & 7                                          |      |
| PR      | 6C31     | User Segment Ahead Label                                             |      |
| PR      | 6C32     | General Segment Back Label                                           |      |

## APPENDIX C

### BMS to BMS2 Conversion Chart

| BMSCode | BMS2Code | Description                                                                                                                 | FHWA |
|---------|----------|-----------------------------------------------------------------------------------------------------------------------------|------|
| PR      | 6C33     | User Segment Back Label                                                                                                     |      |
| PR      | 6C34     | Feature Type                                                                                                                |      |
| R01     | 6C01     | State Roadway Location                                                                                                      |      |
| R01     | 6C02     | State Roadway Location                                                                                                      |      |
| R01     | 6C03     | State Roadway Location                                                                                                      |      |
| R01     | 6C04     | State Roadway Location                                                                                                      |      |
| R01     |          | Not Used                                                                                                                    |      |
| R02     | 5C03     | Position/Prefix - Is the Feature Intersected On or Under the Bridge?                                                        |      |
| R03     | 5C04     | Route Signing Prefix                                                                                                        |      |
| R03     | 5C06     | State Traffic Route/ Suffix                                                                                                 |      |
| R04     | 5C10     | Recent Average Daily Traffic                                                                                                |      |
| R05     | 5C11     | Year of Average Daily Traffic                                                                                               |      |
| R06     | 6C27     | Average Daily Truck Traffic                                                                                                 |      |
| R07     | 6C28     | Year of Average Daily Truck Traffic                                                                                         |      |
| R07A    | 5C14     | Average Daily Truck Traffic (Percent)                                                                                       |      |
| R08     | 6C07     | Government Level of Control                                                                                                 |      |
| R09     | 6C06     | Federal Aid                                                                                                                 |      |
| R10     | 5C22     | Functional Classification                                                                                                   |      |
| R10     | 6C17     | Functional Classification                                                                                                   |      |
| R11     | 6C08     | Urban/Rural Designation                                                                                                     |      |
| R12     | 6C09     | Highway Indicator                                                                                                           |      |
| R12     | 6C12     | Interstate Network (INT) Indicator                                                                                          |      |
| R12     | 6C13     | CCVNET Indicator                                                                                                            |      |
| 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    | IS01     | Inspection Type for Sign Structure                                                                                          |      |
| S02     | 7A09     | Inspection Frequency                                                                                                        |      |
| S02     | IS13     | Frequency of Inspection of Sign Structure                                                                                   |      |
| S02A    | 6B20     | Next Inspection Type                                                                                                        |      |
| S02A    | IS12     | Next Inspection Type for Sign Structure                                                                                     |      |
| S03     | 7A05     | Inspection Performed By                                                                                                     |      |
| S04     | VI12     | Special Equipment Type                                                                                                      |      |
| S05     | VS25     | Total Area of Signs on the Structure                                                                                        |      |
| S06     | VS12     | Number of Lights on Structure                                                                                               |      |
| S12     | VS01     | Sign Structure Material Type                                                                                                |      |
| S12     | VS02     | Physical Makeup of Sign Structure                                                                                           |      |
| S12     | VS03     | Type of Span Interaction for Sign Structure                                                                                 |      |
| S12     | VS04     | Structural Configuration of Sign Structure                                                                                  |      |
| S13     | 6A26     | Material Used for Main Unit, Approach Unit, Sign Structure and Walls (Department)                                           |      |
| S13     | 6A27     | Physical Makeup of Primary Load Carrying Members of Main for Main Unit Approach Unit, Sign Structure and Walls (Department) |      |
| S13     | 6A28     | Type of Span Interaction for Main Unit, Approach Unit, Sign Structure and Walls (Department)                                |      |
| S13     | 6A29     | Structural Configuration Used for Main Unit                                                                                 |      |
| 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     | Lanes Under the Structure                                                                                                   |      |
| S20A    | VS29     | Number of Lanes Under Sign Structure                                                                                        |      |
| S21     | 5B18     | Structure Length                                                                                                            |      |
| S21     | VS27     | Length of Sign Structure                                                                                                    |      |
| S21A    | VS30     | Median Width                                                                                                                |      |
| S22     | IS02     | Column Base Condition Rating                                                                                                |      |
| S23     | IS03     | Guiderail Condition Rating                                                                                                  |      |
| S24     | IS04     | Column Condition Rating                                                                                                     |      |
| S25     | IS05     | Access Condition Rating                                                                                                     |      |
| S26     | IS06     | Sign Condition Rating                                                                                                       |      |
| S27     | IS07     | Light Condition Rating                                                                                                      |      |
| S28     | IS08     | Surface Condition Rating                                                                                                    |      |
| S29     | IS09     | Horizontal Member Condition Rating                                                                                          |      |
| S30     | 4A09     | Structural Evaluation                                                                                                       |      |
| S30     | IS10     | Overall Condition Rating of the Wall                                                                                        |      |
| S31     | IS11     | Inspection Notes                                                                                                            |      |
| S32     | IS11     | Inspection Notes                                                                                                            |      |
| S33     | IS11     | Inspection Notes                                                                                                            |      |
| S34     | IS11     | Inspection Notes                                                                                                            |      |
| S35     | IS11     | Inspection Notes                                                                                                            |      |
| S36     | IS11     | Inspection Notes                                                                                                            |      |

## APPENDIX C

### BMS to BMS2 Conversion Chart

| BMSCode | BMS2Code   | Description                                                                                                                 | FHWA |
|---------|------------|-----------------------------------------------------------------------------------------------------------------------------|------|
| 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       | Total Length of Wall                                                                                                        |      |
| T07     | VW31       | Approximate Area of the Wall                                                                                                |      |
| T08     | 6A26       | Material Used for Main Unit, Approach Unit, Sign Structure and Walls (Department)                                           |      |
| T08     | 6A27       | Physical Makeup of Primary Load Carrying Members of Main 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                                                                                 |      |
| T08     | VW01       | Wall Material                                                                                                               |      |
| T08     | VW02       | Physical Makeup of Wall                                                                                                     |      |
| T08     | VW03       | Type of Span Interaction for Wall                                                                                           |      |
| T08     | VW04       | Structural Configuration of Wall                                                                                            |      |
| 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     | 4A09       | Structural Evaluation                                                                                                       |      |
| T17     | IW10       | Overall Condition Rating of the Wall                                                                                        |      |
| T18     | 2A02       | Inspection Notes                                                                                                            |      |
| T18     | IW11       | Wall Inspection Notes                                                                                                       |      |
| T18     | VW32       | Narrative Text                                                                                                              |      |
| T19     | VW32       | Narrative Text                                                                                                              |      |
| T20     | VW32       | Narrative Text                                                                                                              |      |
| T21     | VW32       | Narrative Text                                                                                                              |      |
| T22     | VW32       | Narrative Text                                                                                                              |      |
| T23     | VW32       | Narrative Text                                                                                                              |      |
| T24     | VW32       | Narrative Text                                                                                                              |      |
| W01     | 7A01       | Inspection Date                                                                                                             |      |
| W01A    | 7A01       | Inspection Date                                                                                                             | 93B  |
| W02     | 7A03, 7A06 | Primary Type of Inspection & Type of Inspections Performed                                                                  |      |
| W02A    | 7A03, 7A06 | Primary Type of Inspection & Type of Inspections Performed                                                                  |      |
| W03     | 7A09       | Inspection Frequency                                                                                                        | 92B  |
| W04     | 7A09       | Inspection Frequency                                                                                                        |      |
| W06     | 4A08       | Scour Critical Bridge Indicator                                                                                             | 113  |
| W07     | IN15       | Stream Bed Material                                                                                                         |      |
| W07     | IU06       | Stream Bed Material                                                                                                         |      |
| 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       | Foundation Type                                                                                                             |      |
| W10     | IN14       | Foundation Type                                                                                                             |      |
| 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     |            | Not Used                                                                                                                    |      |
|         | 1A07       | Unrepaired Spalls                                                                                                           |      |
|         | 1A08       | Review Needed                                                                                                               |      |
|         | 1A09       | Inspection Status                                                                                                           |      |
|         | 1A10       | Element Quantity                                                                                                            |      |
|         | 1A11       | Qty1 / Qty2 / Qty3 / Qty4 / Qty5                                                                                            |      |
|         | 1A12       | Element Condition                                                                                                           |      |
|         | 1B01       | Element ID                                                                                                                  |      |

## APPENDIX C

### BMS to BMS2 Conversion Chart

| BMSCode | BMS2Code | Description                                       | FHWA |
|---------|----------|---------------------------------------------------|------|
|         | 1B02     | Structure Unit                                    |      |
|         | 1B03     | Environment                                       |      |
|         | 1B04     | Quantity/Count                                    |      |
|         | 1B05     | Scale Factor                                      |      |
|         | 1B06     | Element Record Trigger                            |      |
|         | 1B07     | Element Description                               |      |
|         | 3A01     | Type of Work                                      |      |
|         | 3A02     | Candidate ID                                      |      |
|         | 3A10     | Applicable Condition States                       |      |
|         | 3A12     | Assigned Indicator                                |      |
|         | 3A14     | Status of Work Candidate                          |      |
|         | 4A01     | Is the Bridge Open, Posted, or Closed?            |      |
|         | 4A03     | Bridge Railings                                   |      |
|         | 4A04     | Transitions                                       |      |
|         | 4A05     | Approach Guiderail                                |      |
|         | 4A06     | Approach Guiderail Ends                           |      |
|         | 4A14     | Health Index                                      |      |
|         | 4A15     | Minimum Vertical Clearance Over Bridge Roadway    |      |
|         | 4A16     | Minimum Vertical Underclearance Reference Feature |      |
|         | 4A17     | Minimum Vertical Underclearance                   |      |
|         | 4A18     | Minimum Lateral Underclearance Reference Feature  |      |
|         | 4B02     | Rating Date and Initials                          |      |
|         | 4B04     | Operating Rating Type                             |      |
|         | 4B05     | Operating Rating                                  |      |
|         | 4B06     | Inventory Rating Type                             |      |
|         | 4B07     | Inventory Rating                                  |      |
|         | 4B08     | H20 Operating Rating Type                         |      |
|         | 4B09     | H20 Operating Rating                              |      |
|         | 4B10     | H20 Inventory Rating Type                         |      |
|         | 4B11     | H20 Inventory Rating                              |      |
|         | 4B12     | ML80                                              |      |
|         | 4B13     | TK527                                             |      |
|         | 4B14     | Truck Type 3                                      |      |
|         | 4B15     | Load Rating Review Recommended                    |      |
|         | 5A03     | NBI Structure Name                                |      |
|         | 5A04     | District Number                                   |      |
|         | 5A05     | County Code                                       |      |
|         | 5A22     | On or Off Agency System                           |      |
|         | 5A23     | Agency Administration Area                        |      |
|         | 5B01     | Bridge Deck Structure Type                        |      |
|         | 5B08     | Median Type                                       |      |
|         | 5B12     | Main Span Material (FHWA)                         |      |
|         | 5B13     | Structural Configuration of Main Span (FHWA)      |      |
|         | 5B15     | Approach Span Material (FHWA)                     |      |
|         | 5B16     | Structural Configuration of Approach Spans (FHWA) |      |
|         | 5B19     | Deck Area                                         |      |
|         | 5B20     | Total Length                                      |      |
|         | 5C02     | NBI Roadway                                       |      |
|         | 5C09     | ADT Class                                         |      |
|         | 5C16     | Detour Speed                                      |      |
|         | 5C17     | Accident Count                                    |      |
|         | 5C18     | Mile Point                                        |      |
|         | 5C19     | National Base Highway Network                     |      |
|         | 5C20     | LRS Inventory Route and Subroute Number           |      |
|         | 5C23     | Traffic Direction                                 |      |
|         | 5C25     | Total Horizontal Clearance                        |      |
|         | 5C31     | Federal Lands Highway                             |      |
|         | 5C34     | Emergency Indicator                               |      |
|         | 5C35     | Agency Roadway 1                                  |      |
|         | 5C36     | Agency Roadway 2                                  |      |
|         | 5C37     | Agency Roadway 3                                  |      |
|         | 5C38     | Agency Roadway 4                                  |      |
|         | 5C39     | Agency Roadway 5                                  |      |
|         | 5D01     | Unit Key                                          |      |
|         | 5D03     | Structure Unit Description                        |      |
|         | 5D05     | Default Bridge Unit Indicator                     |      |
|         | 5E05     | Fracture Critical Details                         |      |
|         | 5E06     | Formulas Trigger                                  |      |
|         | 5E07     | Simulation Trace                                  |      |
|         | 5E08     | Apply Functional Improvement Policy               |      |
|         | 5E09     | Sufficiency Rating Calculation Status             |      |
|         | 5E10     | Asbestos Containing Material (ACM) Status         |      |
|         | 5E11     | ACM Inspections Required (IR)                     |      |

## APPENDIX C

### BMS to BMS2 Conversion Chart

| <b>BMSCode</b> | <b>BMS2Code</b> | <b>Description</b>                                                      | <b>FHWA</b> |
|----------------|-----------------|-------------------------------------------------------------------------|-------------|
|                | 5E12            | ACM Inspections Completed (IC)                                          |             |
|                | 5E13            | ACM Inspection Date                                                     |             |
|                | 5E14            | ACM Quantity                                                            |             |
|                | 5E15            | ACM Number                                                              |             |
|                | 5E16            | ACM Locations                                                           |             |
|                | 5E17            | ACM Locations                                                           |             |
|                | 5E18            | Agency Bridge Items                                                     |             |
|                | 5E19            | Agency Bridge Items                                                     |             |
|                | 5E20            | Agency Bridge Items                                                     |             |
|                | 5E21            | Agency Bridge Items                                                     |             |
|                | 5E22            | Agency Bridge Items                                                     |             |
|                | 5E23            | Agency Bridge Items                                                     |             |
|                | 5E24            | Agency Bridge Items                                                     |             |
|                | 6A12            | Demolished and Replaced Indicator                                       |             |
|                | 6A13            | Demolished and 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                                                                |             |
|                | 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                                                  |             |
|                | 6B02            | New Wearing Surface 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            | Design Exception                                                        |             |
|                | 6B16            | Appraisal Based On                                                      |             |
|                | 6B17            | Average Daily Traffic                                                   |             |
|                | 6B18            | Inventory Rating                                                        |             |
|                | 6B19            | Capacity Appraisal Control                                              |             |
|                | 6B21            | Crane Inspection Date                                                   |             |
|                | 6B22            | (Not Used)                                                              |             |
|                | 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                                         |             |
|                | 6C29            | Oversize Bypass Length                                                  |             |
|                | 6C30            | General Segment Ahead Label                                             |             |
|                | 7A02            | Team Leader                                                             |             |
|                | 7A04            | Review Required                                                         |             |
|                | 7A06            | Type of Inspections Performed                                           |             |
|                | 7A07            | Required Inspections                                                    |             |
|                | 7A08            | Last Inspection Date                                                    |             |
|                | 7A11            | Next Team Leader                                                        |             |
|                | 7A15            | Fracture Critical Inspection Hours                                      |             |
|                | 7A16            | Other 1 Hours                                                           |             |
|                | 7A17            | Underwater Inspection Hours                                             |             |
|                | 7A18            | Other 2 Hours                                                           |             |
|                | AP06            | Work Designated For                                                     |             |
|                | AP09            | SAP Work Order Number                                                   |             |
|                | AP10            | SAP Work Order Status                                                   |             |
|                | AP11            | WBS Element Number                                                      |             |
|                | AP16            | WBS Number                                                              |             |

## APPENDIX C

### BMS to BMS2 Conversion Chart

| <b>BMSCode</b> | <b>BMS2Code</b> | <b>Description</b>                                 | <b>FHWA</b> |
|----------------|-----------------|----------------------------------------------------|-------------|
|                | AP29            | Other Costs                                        |             |
|                | AP31            | Anticipated Environmental Clearance Level          |             |
|                | AP32            | Right-Of-Way Needed?                               |             |
|                | AP33            | Crossover Required?                                |             |
|                | AP34            | Detour Required?                                   |             |
|                | AP35            | Half Width Required?                               |             |
|                | AP36            | Lane Restriction Required?                         |             |
|                | AP37            | Night Only?                                        |             |
|                | AP38            | Temporary Bridge Required?                         |             |
|                | AP39            | None Required                                      |             |
|                | FR02            | Is the Feature Intersected On or Under the Bridge? |             |
|                | FR08            | Span Description                                   |             |
|                | FR09            | Additional Operator                                |             |
|                | FR16            | Notes                                              |             |
|                | FT02            | Utility Type                                       |             |
|                | FT07            | Hazmat Indicator                                   |             |
|                | FT08            | Location of Utility                                |             |
|                | FT09            | Contact Information                                |             |
|                | FT10            | Notes                                              |             |
|                | FW02            | Stream Classification 1                            |             |
|                | FW03            | Stream Classification 2                            |             |
|                | FW04            | Reserved                                           |             |
|                | 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                         |             |
|                | IF02            | Member Type                                        |             |
|                | IN04            | Change Since Last Inspection                       |             |
|                | IN05            | Scour Hole                                         |             |
|                | IN06            | Debris Potential                                   |             |
|                | IN07            | Substructure Scourability                          |             |
|                | IN08            | Opening Adequacy/Channel                           |             |
|                | IN09            | Sediment Deposits                                  |             |
|                | IN10            | Alignment                                          |             |
|                | IN11            | Velocity/Stream Slope                              |             |
|                | IN12            | Pier / Abutment Type                               |             |
|                | IN19            | Movement Indicator                                 |             |
|                | IN20            | Scour / Undermining Indicator                      |             |
|                | IR01            | Reviewer Action                                    |             |
|                | IR02            | Rating Date                                        |             |
|                | IR03            | Calculation Date                                   |             |
|                | IR05            | NBI                                                |             |
|                | IR16            | Engineer                                           |             |
|                | IR17            | Rating Dataset                                     |             |
|                | IR19            | Notes                                              |             |
|                | IS14            | Complete Next Inspection By This Date              |             |
|                | IU01            | Recalculate (SCBI)                                 |             |
|                | IU03            | SCBI Source                                        |             |
|                | IU04            | Observed Scour Assessment (OSA)                    |             |
|                | 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         |             |

## APPENDIX C

### BMS to BMS2 Conversion Chart

| BMSCode | BMS2Code | Description                                                      | FHWA |
|---------|----------|------------------------------------------------------------------|------|
|         | IU26     | Work Candidate                                                   |      |
|         | 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                        |      |
|         | SL19     | Year of Interim Specifications Used In Determining Shear Ratings |      |
|         | SL23     | Rating Sequence Number                                           |      |
|         | SL25     | Load Type                                                        |      |
|         | SP01     | Span Type                                                        |      |
|         | SP02     | Label                                                            |      |
|         | SP05     | Flare Indicator                                                  |      |
|         | SP06     | Span Description                                                 |      |
|         | SS02     | Actual Span                                                      |      |
|         | SS05     | Continuous Beginning Span                                        |      |
|         | SS10     | Notes                                                            |      |
|         | VD20     | Minimum Fill Height Over Culvert                                 |      |
|         | VD21     | Maximum Fill Height Over Culvert                                 |      |
|         | VD22     | Effective Width of Hydraulic Opening                             |      |
|         | VD24     | Floor Type                                                       |      |
|         | 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                                                            |      |
|         | VM06     | PUC Order Date                                                   |      |
|         | VM07     | Notes                                                            |      |
|         | VN02     | Soil Boring Notes                                                |      |
|         | VN03     | Test Description                                                 |      |
|         | VN04     | Storage Location                                                 |      |
|         | VS05     | Mounting Type                                                    |      |
|         | VS06     | Foundation Type                                                  |      |
|         | VS07     | Manufacturer                                                     |      |
|         | VS08     | Inspection Location Information                                  |      |
|         | 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     | Narrative Text                                                   |      |
|         | VW05     | Foundation Type                                                  |      |
|         | VW08     | Historic Eligibility Information                                 |      |
|         | VW09     | Manufacturer                                                     |      |
|         | VW11     | Mounting Type                                                    |      |
|         | VW12     | Post Type                                                        |      |
|         | VW15     | Were Architectural Forms Used?                                   |      |
|         | VW16     | Type of Reinforcement Bar Protection                             |      |
|         | VW17     | Compressive Strength Concrete at 28 Days                         |      |
|         | VW18     | Support Information                                              |      |
|         | VW19     | Direction Information                                            |      |
|         | VW20     | Installed/Retrofitted                                            |      |
|         | VW25     | Distance to Road                                                 |      |
|         | VW27     | Minimum Clearance                                                |      |

**APPENDIX C**  
**BMS to BMS2 Conversion Chart**

| BMSCode | BMS2Code | Description | FHWA |
|---------|----------|-------------|------|
|---------|----------|-------------|------|

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## **Appendix D**

User Authorization Request Form  
For BMS2 / Crystal Reports / BMS2 Web

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# User Authorization Request Form

## BMS2 / Crystal Reports / BMS2 Web

### User information

Date of Request: \_\_\_\_\_

Name: \_\_\_\_\_

Organization: \_\_\_\_\_

Classification Title: \_\_\_\_\_

Job Title: \_\_\_\_\_

Job Duties: \_\_\_\_\_

Employee Signature: \_\_\_\_\_

CWOPA User ID: \_\_\_\_\_  
(PENNDOT Only)

ECMS User ID: \_\_\_\_\_

RACF User ID: \_\_\_\_\_  
(PENNDOT Only)

Phone No: \_\_\_\_\_

Employee No: \_\_\_\_\_  
(PENNDOT Only)

Supervisor Signature: \_\_\_\_\_ Date \_\_\_\_\_

BQAD Approval: \_\_\_\_\_ Date \_\_\_\_\_

| System                                                                     | Authorization Request<br>(Check appropriate boxes) | Authorization Level<br>(Check appropriate boxes) |  | Organization                                 |
|----------------------------------------------------------------------------|----------------------------------------------------|--------------------------------------------------|--|----------------------------------------------|
| <b>BMS2 - Pontis</b>                                                       | New <input type="checkbox"/>                       | Browser <input type="checkbox"/>                 |  | PennDOT Only                                 |
|                                                                            | Revision <input type="checkbox"/>                  | Inspector <input type="checkbox"/>               |  |                                              |
|                                                                            | Deletion <input type="checkbox"/>                  | Inspector Supervisor <input type="checkbox"/>    |  |                                              |
|                                                                            |                                                    | Project User <input type="checkbox"/>            |  |                                              |
|                                                                            |                                                    | Project Supervisor <input type="checkbox"/>      |  |                                              |
|                                                                            |                                                    | Super User (BQAD only) <input type="checkbox"/>  |  |                                              |
|                                                                            |                                                    | Admin (BQAD only) <input type="checkbox"/>       |  |                                              |
| <b>Crystal Reports for BMS2</b>                                            | New <input type="checkbox"/>                       | Reader Only <input type="checkbox"/>             |  | PennDOT Only                                 |
|                                                                            | Revision <input type="checkbox"/>                  | Reader and Publisher <input type="checkbox"/>    |  |                                              |
|                                                                            | Deletion <input type="checkbox"/>                  | BMS2QUERY Access <input type="checkbox"/>        |  |                                              |
|                                                                            |                                                    |                                                  |  |                                              |
| <b>BMS2 Web</b><br>(PennDOT users must also complete an ECMS request form) | New <input type="checkbox"/>                       | Admin <input type="checkbox"/>                   |  | Consultant <input type="checkbox"/>          |
|                                                                            |                                                    | Browser <input type="checkbox"/>                 |  | Municipality <input type="checkbox"/>        |
|                                                                            | Revision <input type="checkbox"/>                  | Browser Inventory <input type="checkbox"/>       |  | Planning Partner <input type="checkbox"/>    |
|                                                                            | Deletion <input type="checkbox"/>                  | Browser Inspection <input type="checkbox"/>      |  | FHWA <input type="checkbox"/>                |
|                                                                            |                                                    | Inspector <input type="checkbox"/>               |  | Agency Bridge Owner <input type="checkbox"/> |
|                                                                            |                                                    | Inspector Supervisor <input type="checkbox"/>    |  | PennDOT <input type="checkbox"/>             |
|                                                                            |                                                    | Owner Agent <input type="checkbox"/>             |  |                                              |
|                                                                            |                                                    | Structure Owner <input type="checkbox"/>         |  |                                              |
|                                                                            |                                                    |                                                  |  |                                              |
|                                                                            |                                                    |                                                  |  |                                              |

Training: The user has become familiar with the manuals and users guides and has received adequate training to perform the requested capabilities.

See reverse side for descriptions of Authorization Levels.

## AUTHORIZATION LEVEL DESCRIPTIONS

**Admin** - By registering as a Business Partner an organization is provided with a single BP Administrator userid. This administration userid is used to manage and maintain all BMS2 Web and ECMS userids for that organization's users. The BP Administrator user has access only to security and Business Partner information. "Named" userids must be created to gain access to BMS2 Web 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. (*Applicable organizations - PennDOT, Consultant, Municipality, Planning Partner, FHWA and Agency Bridge Owner*)

**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. Therefore, within BMS2 Web a user with Browser access can only view data – fields are protected and edit functions are disabled. (*Applicable organizations - PennDOT, Consultant, Municipality, FHWA and Agency Bridge Owner*)

**Browser Inventory** - Same as Browser except only the modules with inventory data may be accessed, but nothing in the database can be changed. (*Applicable organizations - Consultant, Municipality, FHWA and Agency Bridge Owner*)

**Browser Inspection** - Same as Browser except only the modules with inspection data may be accessed, but nothing in the database can be changed. (*Applicable organizations - Consultant, Municipality, FHWA and Agency Bridge Owner*)

**Inspector** - The Inspector role allows for reading all inspection and inventory data and using all of the Inventory and Inspection related functionality of BMS2 Web. Within BMS2 Web, 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. (*Applicable organizations - PennDOT, Consultant, Municipality and Agency Bridge Owner*)

**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 Web, users with Inspector Supervisor authority have the ability to edit all inspection data available in BMS2 Web, regardless of the corresponding inspection status. (*Applicable organizations - PennDOT, Consultant, Municipality and Agency Bridge Owner*)

**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. (*Applicable organizations - Consultant, Municipality and Agency Bridge Owner*)

**Structure Owner** - A Structure Owner has full access to edit and maintain all structure-related data provided via BMS2 Web. 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. (*Applicable organizations - Municipality and Agency Bridge Owner*)

**Project User** - The Project User role provides access to the project planning and programming modules within Pontis. Users authorized with the Project User role also have the ability to use the Gateway module and can access the inspection module, but are not active inspectors (i.e., cannot edit inspection data). (*Applicable organizations - PennDOT*)

**Project Supervisor** - The Project Supervisor role builds on the Project User role with additional abilities to modify improvement models and costs, modify improvement policies, and access the preservation modules. (*Applicable organizations - PennDOT*)

**Super User** - The Super User role has full authority within BMS2 to perform any action. The Super User role provides update access to the Pontis Configuration module to edit the Pontis parameter tables, including the definition and modification of structure elements. All Pontis functionality is available to the Super User. (*Applicable organizations - PennDOT - BQAD*)

## **Appendix E**

Crystal Reports Tables for BMS2 Items

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## APPENDIX E

### Crystal Reports Tables for BMS2 Items

| BMS2Code         | Table Name | Column Name        | BMS Code       |
|------------------|------------|--------------------|----------------|
|                  | INSPEVNT   | BRKEY              | STRUCT_REF_NUM |
| 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          |                |
| 1A08             | INSPEVNT   | REV_REQ            |                |
| 1A09             | INSPEVNT   | INSPSTAT           |                |
| 1A10             | ELEMINSPI  | QUANTITY           |                |
| 1A11             | ELEMINSPI  | QTYYSTATE1,2,3,4,5 |                |
| 1A12             | ELEMINSPI  | NOTES              |                |
| 2A01, VW32       | BRIDGE     | NOTES              | L_NAR_TEXT     |
| 2A02, IW11       | INSPEVNT   | NOTES              | T18            |
| 3A               | INSP_WCAND | NOTES              | H03            |
| 3A02             | INSP_WCAND | WC_ID              |                |
| 3A03             | INSP_WCAND | STRUNITKEY         |                |
| 3A04             | INSP_WCAND | ESTIMQUANTITY      | H05            |
| 3A06             | INSP_WCAND | ACTCODE            | H01            |
| 3A07             | INSP_WCAND | ESTIMCOST          | H06            |
| 3A08             | INSP_WCAND | AGENCY_PRIORITY    | H08            |
| 3A09             | INSP_WCAND | WORKRECDATE        | H10            |
| 3A11             | INSP_WCAND | TARGETYEAR         | H12            |
| 3A12             | INSP_WCAND | ASSIGNED           |                |
| 3A13             | INSP_WCAND | WORKASSIGNMENT     | H09            |
| 3B               | BRIDGE     | NBITOTCOST         | F24            |
| 3B01             | BRIDGE     | PROPWORK           | F02            |
| 3B02             | BRIDGE     | WORKBY             | F02            |
| 3B03             | BRIDGE     | IMPLEN             | F05            |
| 3B04             | BRIDGE     | NBIIMPCOST         | F20            |
| 3B05             | BRIDGE     | NBIRWCOST          | F21            |
| 3B06             | BRIDGE     | NBITOTCOST         | F24            |
| 3B07             | BRIDGE     | NBIYRCOST          | F01            |
| 4A01             | INSPEVNT   | OPPOSTCL           | D13            |
| 4A02             | INSPEVNT   | APPRALIGN          | E28            |
| 4A03, IA03       | INSPEVNT   | RAILRATING         | E28A           |
| 4A04, IA03       | INSPEVNT   | TRANSRATIN         | E28A           |
| 4A05, IA03       | INSPEVNT   | ARAILRATIN         | E28A           |
| 4A06, IA03       | INSPEVNT   | AENDRATING         | E28A           |
| 4A07             | INSPEVNT   | PIERPROT           | D12            |
| 4A08             | INSPEVNT   | SCOURCRIT          | E29A           |
| 4A08             | INSPEVNT   | SCOURCRIT          | W06            |
| 4A09, IS10, IW10 | INSPEVNT   | STRRATING          | E24            |
| 4A09, IS10, IW10 | INSPEVNT   | STRRATING          | T17            |
| 4A09, IS10, IW10 | INSPEVNT   | STRRATING          | S30            |
| 4A10             | INSPEVNT   | DECKGEOM           | E25            |
| 4A11             | INSPEVNT   | UNDERCLR           | E26            |
| 4A12             | INSPEVNT   | NBI_RATING         | M08            |
| 4A13             | INSPEVNT   | SUFF_RATE          | M05            |
| 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            |

## APPENDIX E

### Crystal Reports Tables for BMS2 Items

| BMS2Code         | Table Name | Column Name  | BMS Code          |
|------------------|------------|--------------|-------------------|
| 4B02             | BRIDGE     | RATINGDATE   |                   |
| 4B02             | BRIDGE     | RATING_INI   |                   |
| 4B03             | BRIDGE     | POSTING      | E29               |
| 4B04             | BRIDGE     | ORTYPE       | E31               |
| 4B05             | BRIDGE     | ORLOAD       | E31               |
| 4B06             | BRIDGE     | IRTYPE       | E30               |
| 4B07             | BRIDGE     | IRLOAD       | E30               |
| 4B08             | BRIDGE     | ALTORMETH    |                   |
| 4B09             | BRIDGE     | ALTORLOAD    | E31               |
| 4B10             | BRIDGE     | ALTIRMETHOD  |                   |
| 4B11             | BRIDGE     | ALTIRLOAD    | E30               |
| 4B12             | BRIDGE     | TRUCK1IR     | E30               |
| 4B13             | BRIDGE     | TRUCK1OR     | E31               |
| 4B14             | BRIDGE     | TRUCK2IR     | E30               |
| 4B15             | BRIDGE     | TRUCK2OR     | E31               |
| 5A01             | BRIDGE     | BRIDGE_ID    | A01               |
| 5A01             | BRIDGE     | BRIDGE_ID    | A01               |
| 5A01             | BRIDGE     | BRIDGE_ID    | A01               |
| 5A02             | BRIDGE     | STRUCNAME    | A06               |
| 5A03             | BRIDGE     | BRKEY        | STRUCTURE_REF_NUM |
| 5A04             | BRIDGE     | DISTRICT     |                   |
| 5A05             | BRIDGE     | COUNTY       |                   |
| 5A06             | BRIDGE     | PLACECODE    | A37               |
| 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               |
| 5A12             | BRIDGE     | NSTATECODE   | A04               |
| 5A13             | BRIDGE     | BB_BRDGEID   | A04               |
| 5A14             | BRIDGE     | FIPS_STATE   | A37               |
| 5A14             | BRIDGE     | FHWA_REGN    | A37               |
| 5A15, VW13       | BRIDGE     | YEARBUILT    | A16               |
| 5A16, VW14       | BRIDGE     | YEARRECON    | A17               |
| 5A17             | BRIDGE     | SERVYPON     | A26               |
| 5A18             | BRIDGE     | SERVYPUND    | A26               |
| 5A19, VS28       | BRIDGE     | SUMLANES     | B11               |
| 5A19, VS28       | BRIDGE     | SUMLANES     | S21               |
| 5A19, VS28       | BRIDGE     | SUMLANES     | B34               |
| 5A20             | BRIDGE     | CUSTODIAN    | A23               |
| 5A21, VW33, VS32 | BRIDGE     | OWNER        | A20               |
| 5A22             | BRIDGE     | ON_OFF_SYS   |                   |
| 5A23             | BRIDGE     | ADMINAREA    |                   |
| 5B01             | BRIDGE     | DKSTRUCTYP   | C09               |
| 5B02             | BRIDGE     | DKSURFTYPE   | C10               |
| 5B03             | BRIDGE     | DKMEMBTYP    | C10               |
| 5B04             | BRIDGE     | DKPROTECT    | C10               |
| 5B05             | BRIDGE     | LFTCURBSW    | A34               |
| 5B06             | 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               |

## APPENDIX E

### Crystal Reports Tables for BMS2 Items

| BMS2Code         | Table Name | Column Name  | BMS Code       |
|------------------|------------|--------------|----------------|
| 5B16             | BRIDGE     | DESIGNAPPR   | C05            |
| 5B17             | BRIDGE     | MAXSPAN      | C08            |
| 5B18, VS27, VW30 | BRIDGE     | LENGTH       | T06            |
| 5B18, VS27, VW30 | BRIDGE     | LENGTH       | S21            |
| 5B18, VS27, VW30 | BRIDGE     | LENGTH       | C07            |
| 5B19             | BRIDGE     | DECK_AREA    |                |
| 5B20             | BRIDGE     | TOT_LENGTH   |                |
|                  | ROADWAY    | BRKEY        | STRUCT_REF_NUM |
| 5C01, FW01       | ROADWAY    | ROADWAY_NAME | D06            |
| 5C01, FW01       | ROADWAY    | ROADWAY_NAME | B03            |
| 5C02             | ROADWAY    | NBI_RW_FLAG  |                |
| 5C03             | ROADWAY    | ON_UNDER     | ON_UND         |
| 5C03             | ROADWAY    | ON_UNDER     | B04            |
| 5C03             | ROADWAY    | ON_UNDER     | R02            |
| 5C04             | ROADWAY    | KIND_HWY     | B07            |
| 5C04             | ROADWAY    | KIND_HWY     | R03            |
| 5C05             | ROADWAY    | LEVL_SRVC    | B08            |
| 5C06             | ROADWAY    | DIRSUFFIX    | B06            |
| 5C06             | ROADWAY    | DIRSUFFIX    | R03            |
| 5C06             | ROADWAY    | ROUTENUM     | B05            |
| 5C06             | ROADWAY    | ROUTENUM     | R03            |
| 5C07             | ROADWAY    | CRIT_FEAT    | A28            |
| 5C08, FR07       | ROADWAY    | LANES        | B11            |
| 5C08, FR07       | ROADWAY    | LANES        | B34            |
| 5C09             | ROADWAY    | ADTCLASS     |                |
| 5C10             | ROADWAY    | ADTTOTAL     | B27            |
| 5C10             | ROADWAY    | ADTTOTAL     | R04            |
| 5C11             | ROADWAY    | ADTYEAR      | B28            |
| 5C11             | ROADWAY    | ADTYEAR      | R05            |
| 5C12             | ROADWAY    | ADTFUTURE    | F10            |
| 5C13             | ROADWAY    | ADTFUTYEAR   | F11            |
| 5C14             | ROADWAY    | TRUCKPCT     | B30A           |
| 5C14             | ROADWAY    | TRUCKPCT     | R07A           |
| 5C15             | ROADWAY    | BYPASSLEN    | A35            |
| 5C16             | ROADWAY    | DET_SPEED    |                |
| 5C17             | ROADWAY    | TEN_YR_CNT   |                |
| 5C17             | ROADWAY    | ACC_RATE     |                |
| 5C18             | ROADWAY    | KMPOST       |                |
| 5C19             | ROADWAY    | ONBASENET    |                |
| 5C20             | ROADWAY    | SUBRTNUM     | E31            |
| 5C20             | ROADWAY    | LNSINVRT     | E31            |
| 5C21             | ROADWAY    | TOLLFAC      | A25            |
| 5C22             | ROADWAY    | FUNCCLASS    | B18            |
| 5C22             | ROADWAY    | FUNCCLASS    | 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      | B17A           |
| 5C30             | ROADWAY    | SCHOOL_BUS   | A18            |
| 5C31             | ROADWAY    | FEDLANDHWY   |                |
| 5C32             | ROADWAY    | TRANSIT_RT   | A19            |
| 5C33             | ROADWAY    | TRUCKNET     | B19A           |
| 5C34             | ROADWAY    | CRIT_TRAV    |                |
| 5C35             | ROADWAY    | USERRWKEY1   |                |
| 5C36             | ROADWAY    | USERRWKEY2   |                |
| 5C37             | ROADWAY    | USERRWKEY3   |                |
| 5C38             | ROADWAY    | USERRWKEY4   |                |
| 5C39             | ROADWAY    | USERRWKEY5   |                |

## APPENDIX E

### Crystal Reports Tables for BMS2 Items

| BMS2Code | Table Name                  | Column Name        | BMS Code          |
|----------|-----------------------------|--------------------|-------------------|
|          | STRUCTURE_UNIT              | BRKEY              | STRUCTURE_REF_NUM |
|          | STRUCTURE_UNIT, USERSTRUNIT | BRKEY              | STRUCTURE_REF_NUM |
| 5D01     | STRUCTURE_UNIT              | STRUNITKEY         |                   |
| 5D02     | STRUCTURE_UNIT              | STRUNITLABEL       | SPAN_NO           |
| 5D02     | STRUCTURE_UNIT              | STRUNITLABEL       | W09               |
| 5D03     | STRUCTURE_UNIT              | STRUNITDESCRIPTION |                   |
| 5D04     | STRUCTURE_UNIT              | STRUNITTYPE        | J09               |
| 5D04     | STRUCTURE_UNIT              | STRUNITTYPE        | C16               |
| 5D04     | STRUCTURE_UNIT              | STRUNITTYPE        | MAIN_APPR_IND     |
| 5D04     | USERSTRUNIT                 | SPAN_QTY           | C17               |
| 5D05     | USERSTRUNIT                 | SPAN_LENGTH        | C17               |
| 5E01     | BRIDGE                      | NBISLEN            | C07               |
| 5E02     | BRIDGE                      | PARALSTRUC         | B10               |
| 5E03     | BRIDGE                      | TEMPSTRUC          | A27               |
| 5E04     | BRIDGE                      | HISTSIGN           | C01               |
| 5E05     | BRIDGE                      | FC_DETAIL          |                   |
| 5E06     | BRIDGE                      | BRTRIGGER          |                   |
| 5E07     | BRIDGE                      | TRACEFLAG          |                   |
| 5E08     | BRIDGE                      | DEF_OP_RAT         |                   |
| 5E09     | BRIDGE                      | SRSTATUS           |                   |
| 5E10     | BRIDGE                      | USERKEY1           |                   |
| 5E11     | BRIDGE                      | USERKEY2           |                   |
| 5E12     | BRIDGE                      | USERKEY3           |                   |
| 5E13     | BRIDGE                      | USERKEY4           |                   |
| 5E14     | BRIDGE                      | USERKEY5           |                   |
| 5E15     | BRIDGE                      | USERKEY6           |                   |
| 5E16     | BRIDGE                      | USERKEY7           |                   |
| 5E17     | BRIDGE                      | USERKEY8           |                   |
| 5E18     | BRIDGE                      | USERKEY9           |                   |
| 5E19     | BRIDGE                      | USERKEY10          |                   |
| 5E20     | BRIDGE                      | USERKEY11          |                   |
| 5E21     | BRIDGE                      | USERKEY12          |                   |
| 5E22     | BRIDGE                      | USERKEY13          |                   |
| 5E23     | BRIDGE                      | USERKEY14          |                   |
| 5E24     | BRIDGE                      | USERKEY15          |                   |
| 6A01     | USERBRDG                    | SEN_DISTRICT       | R13               |
| 6A01     | USERBRDG                    | SEN_DISTRICT       | A02               |
| 6A01     | USERBRDG                    | SEN_DISTRICT2      | A02               |
| 6A02     | USERBRDG                    | CONG_DISTRICT      | R14               |
| 6A02     | USERBRDG                    | CONG_DISTRICT      | A03               |
| 6A02     | USERBRDG                    | CONG_DISTRICT2     | A03               |
| 6A03     | USERBRDG                    | LEG_DISTRICT       | R15               |
| 6A03     | USERBRDG                    | LEG_DISTRICT       | A04               |
| 6A03     | USERBRDG                    | LEG_DISTRICT2      | A04               |
| 6A04     | USERBRDG                    | BOUNDARY_CODE      | A10               |
| 6A05     | USERBRDG                    | UTIL_PRESENT       | C34               |
| 6A06     | USERBRDG                    | SUB_AGENCY         | A05               |
| 6A07     | USERBRDG                    | FED_FUND           | A12               |
| 6A08     | USERBRDG                    | DEPT_LENGTH        | C07               |
| 6A09     | USERBRDG                    | CRITFacility       | A28               |
| 6A10     | USERBRDG                    | FLOOD_INSP         | E02A              |
| 6A11     | USERBRDG                    | COVERED_BRIDGE     | C01A              |
| 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          |                   |

## APPENDIX E

### Crystal Reports Tables for BMS2 Items

| BMS2Code         | Table Name        | Column Name                | BMS Code           |
|------------------|-------------------|----------------------------|--------------------|
| 6A21             | USERBRDG          | DEICING_EQUIP              |                    |
| 6A22             | USERBRDG          | CORRIDOR                   |                    |
| 6A23             | USERBRDG          | OWNER_DESC                 | A20                |
| 6A24             | USERBRDG          | TURNBACK                   |                    |
| 6A25             | NOT USED          | NOT USED                   |                    |
| 6A26             | USERBRDG          | DEPT_APPR_MATERIAL_TYPE    | C05                |
| 6A26 - 6A29      | T_DEPT_STRUC_TYPE | DEPT_STRUC_DESC            | DEPT_STRUC_DESC    |
| 6A26 - 6A29      | T_DEPT_STRUC_TYPE | DEPT_STRUC_TYPE            | C05_DPT_MAINSTR_TY |
| 6A26, VS01, VW01 | USERBRDG          | DEPT_MAIN_MATERIAL_TYPE    | T08                |
| 6A26, VS01, VW01 | USERBRDG          | DEPT_MAIN_MATERIAL_TYPE    | S12                |
| 6A26, VS01, VW01 | USERBRDG          | DEPT_MAIN_MATERIAL_TYPE    | C05                |
| 6A27             | USERBRDG          | DEPT_APPR_PHYSICAL_TYPE    | C05                |
| 6A27, VS02, VW02 | USERBRDG          | DEPT_MAIN_PHYSICAL_TYPE    | T08                |
| 6A27, VS02, VW02 | USERBRDG          | DEPT_MAIN_PHYSICAL_TYPE    | S12                |
| 6A27, VS02, VW02 | USERBRDG          | DEPT_MAIN_PHYSICAL_TYPE    | C05                |
| 6A28             | USERBRDG          | DEPT_APPR_SPAN_INTERACTION | C05                |
| 6A28, VS03, VW03 | USERBRDG          | DEPT_MAIN_SPAN_INTERACTION | T08                |
| 6A28, VS03, VW03 | USERBRDG          | DEPT_MAIN_SPAN_INTERACTION | S12                |
| 6A28, VS03, VW03 | USERBRDG          | DEPT_MAIN_SPAN_INTERACTION | C05                |
| 6A29             | USERBRDG          | DEPT_APPR_STRUC_CONFIG     | C05                |
| 6A29, VS04, VW04 | USERBRDG          | DEPT_MAIN_STRUC_CONFIG     | T08                |
| 6A29, VS04, VW04 | USERBRDG          | DEPT_MAIN_STRUC_CONFIG     | S12                |
| 6A29, VS04, VW04 | USERBRDG          | DEPT_MAIN_STRUC_CONFIG     | C05                |
| 6A30             | USERBRDG          | APPR_DKSURFTYPE            | C10                |
| 6A31             | USERBRDG          | APPR_DKMEMBTYP             | C10                |
| 6A32             | USERBRDG          | APPR_DKPROTECT             | C10                |
| 6A33             | USERBRDG          | Appr_WS_Thickness          | C10                |
| 6A33             | USERBRDG          | Main_WS_Thickness          | C10                |
| 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                |
| 6A42             | USERBRDG          | Deck_Rebar_Type            | C21                |
| 6A43             | USERBRDG          | Appr_Pavement_Width        | A29                |
| 6A44             | USERBRDG          | APPR_FC_GROUP_NUM          | C18                |
| 6A44             | USERBRDG          | MAIN_FC_GROUP_NUM          | C18                |
| 6A45             | USERBRDG          | APPR_CRF_MEM_TYPE          | C18                |
| 6A45             | USERBRDG          | MAIN_CRF_MEM_TYPE          | C18                |
| 6A46             | USERBRDG          | APPR_CRF_FATIG_SUS         | C18                |
| 6A46             | USERBRDG          | MAIN_CRF_FATIG_SUS         | C18                |
| 6A47             | USERBRDG          | APPR_CRF_MATERIAL          | C18                |
| 6A47             | USERBRDG          | MAIN_CRF_MATERIAL          | C18                |
| 6A48             | USERBRDG          | APPR_CRF_CUM_ADTT          | C18                |
| 6A48             | USERBRDG          | MAIN_CRF_CUM_ADTT          | C18                |
| 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_YEAR     | C15                |
|                  | USERBRDG          | Deck_Recon_Work_Type       | A17                |
|                  | USERBRDG          | EST_TRUCK_TRAFFIC_MONTH    | C15                |
|                  | USERBRDG          | Sub_Recon_Work_Type        | A17                |
|                  | USERBRDG          | Sup_Recon_Work_Type        | A17                |
| 6B01             | USERINSP          | SPEC_INSP_TYPE             | E04                |
| 6B02             | USERINSP          | NEW_WS                     |                    |
| 6B03             | USERINSP          | INV_CORRECT                |                    |

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### Crystal Reports Tables for BMS2 Items

| BMS2Code               | Table Name | Column Name               | BMS Code |
|------------------------|------------|---------------------------|----------|
| 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   | STRATING_TABLE            |          |
| 6B17, IS12, IO06, IW12 | USERINSP   | STRATING_ADT              |          |
| 6B18                   | USERINSP   | STRATING_IRLOAD           |          |
| 6B19                   | USERINSP   | CAP_APPR_CONTROL          |          |
| 6B20                   | USERINSP   | NEXT_INSP_TYPE            |          |
| 6B21                   | USERINSP   | NEXT_CRANE_INSP_DATE      |          |
| 6B22                   | NOT USED   | NOT USED                  |          |
| 6B23                   | USERINSP   | INSP_TEAM_HELPER          |          |
| 6B24                   | USERINSP   | CONSULTANT_HIRED_BY       |          |
| 6B25                   | USERINSP   | LOCAL_INSP_CONTRACT_NUM   |          |
| 6B26                   | USERINSP   | CREWHRS                   |          |
| 6B27                   | USERINSP   | SNOOPERHRS                | E10      |
| 6B28                   | USERINSP   | FLAGGER_HRS               |          |
| 6B29                   | USERINSP   | SPCREWHRS                 |          |
| 6B30                   | USERINSP   | HELPERHRS                 |          |
| 6B31                   | USERINSP   | SPEQUIPHRS                |          |
| 6B32                   | USERINSP   | FIELD_ENG_INSP_COST       | E11      |
| 6B33                   | USERINSP   | RIGGING_EXP_COST          | E11      |
| 6B34                   | USERINSP   | OFFICE_INSP_COST          | E11      |
| 6B35                   | USERINSP   | NEW_PAINT                 | E15      |
| 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      |
|                        | USERINSP   | Consultant_Hired_By_Code  | W17      |
|                        | USERINSP   | Interim_Insp_Freq         | W04      |
| 6C01                   | USERRWAY   | PA_COUNTY                 | CTY CODE |
| 6C01                   | USERRWAY   | PA_COUNTY                 | R01      |
| 6C02                   | USERRWAY   | SR_NUM                    | SR_NO    |
| 6C02                   | USERRWAY   | SR_NUM                    | B02      |
| 6C02                   | USERRWAY   | SR_NUM                    | R01      |
| 6C03                   | USERRWAY   | SEG_NUM                   | SEG_NO   |
| 6C03                   | USERRWAY   | Seg_Num                   | B02      |
| 6C03                   | USERRWAY   | SEG_NUM                   | R01      |
| 6C04                   | USERRWAY   | OFFSET                    | OFFSET   |
| 6C04                   | USERRWAY   | OFFSET                    | 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      |

## APPENDIX E

### Crystal Reports Tables for BMS2 Items

| BMS2Code         | Table Name | Column Name               | BMS Code |
|------------------|------------|---------------------------|----------|
| 6C11             | USERRWAY   | STATE_HWY_NETWORK         | B19      |
| 6C12             | USERRWAY   | INTERSTATE_NETWORK        | R12      |
| 6C13             | USERRWAY   | CCVNET_NETWORK            | R12      |
| 6C14             | USERRWAY   | ATTN_NETWORK              | R12      |
| 6C15             | USERRWAY   | NHS_NETWORK               | R12      |
| 6C16             | USERRWAY   | TTTN_NETWORK              | R12      |
| 6C18             | USERRWAY   | TOT_HOR_CLEAR_LEFT        | B21      |
| 6C19             | USERRWAY   | TOT_HOR_CLEAR_RIGHT       | B21      |
| 6C20             | USERRWAY   | MIN_OVER_VERT_CLEAR_LEFT  | B22      |
| 6C21, FW11       | USERRWAY   | MIN_OVER_VERT_CLEAR_RIGHT | D08      |
| 6C21, FW11       | USERRWAY   | MIN_OVER_VERT_CLEAR_RIGHT | B22      |
| 6C22             | USERRWAY   | DEF_VERT_CLEAR_LEFT       | B23      |
| 6C23             | USERRWAY   | DEF_VERT_CLEAR_RIGHT      | B23      |
| 6C24             | USERRWAY   | VERT_CLEAR_SIGN           | B31      |
| 6C25             | USERRWAY   | BRIDGEMED                 | B10      |
| 6C26             | USERRWAY   | MED_WIDTH                 | B10      |
| 6C27             | USERRWAY   | ADTT                      | B29      |
| 6C27             | USERRWAY   | ADTT                      | R06      |
| 6C28             | USERRWAY   | ADTT_YEAR                 | B30      |
| 6C28             | USERRWAY   | ADTT_YEAR                 | R07      |
| 6C29             | USERRWAY   | OVERSIZE_BYPASS_LENGTH    |          |
| 6C30             | USERRWAY   | ROADWAY_LABEL1            | R16      |
| 6C31             | USERRWAY   | ROADWAY_LABEL2            | R16      |
| 6C32             | USERRWAY   | ROADWAY_LABEL3            | R16      |
| 6C33             | USERRWAY   | ROADWAY_LABEL4            | R16      |
| 7A01             | INSPEVNT   | INSPDATE                  | E06      |
| 7A01             | INSPEVNT   | INSPDATE                  | T01      |
| 7A01             | INSPEVNT   | INSPDATE                  | W01      |
| 7A01             | INSPEVNT   | INSPDATE                  | W01A     |
| 7A01             | INSPEVNT   | INSPDATE                  | S01      |
| 7A01             | INSPEVNT   | INSPDATE                  | W01      |
| 7A01             | INSPEVNT   | INSPDATE                  | J01      |
| 7A01             | INSPEVNT   | INSPDATE                  | J01      |
| 7A02             | INSPEVNT   | INSP_USR_KEY              |          |
| 7A03, IS01, IW01 | INSPEVNT   | INSPTYPE                  | E07      |
| 7A03, IS01, IW01 | INSPEVNT   | INSPTYPE                  | W02      |
| 7A03, IS01, IW01 | INSPEVNT   | INSPTYPE                  | W02      |
| 7A03, IS01, IW01 | INSPEVNT   | INSPTYPE                  | S01      |
| 7A04             | INSPEVNT   | REV_REQ                   |          |
| 7A05             | INSPEVNT   | INSPECTCONTROLID          | E08      |
| 7A05             | INSPEVNT   | INSPECTCONTROLID          | E12      |
| 7A05             | INSPEVNT   | INSPECTCONTROLID          | T03      |
| 7A05             | INSPEVNT   | INSPECTCONTROLID          | S03      |
| 7A06             | INSPEVNT   | NBINSPDONE                |          |
| 7A06             | INSPEVNT   | ELINSPDONE                |          |
| 7A06             | INSPEVNT   | FCINSPDONE                |          |
| 7A06             | INSPEVNT   | UWINSPDONE                |          |
| 7A06             | INSPEVNT   | OSINSPDONE                |          |
| 7A07             | INSPEVNT   | FCINSPREQ                 |          |
| 7A07             | INSPEVNT   | UWINSPREQ                 |          |
| 7A07             | INSPEVNT   | OSINSPREQ                 |          |
| 7A08             | INSPEVNT   | LASTINSP                  |          |
| 7A08             | INSPEVNT   | FCLASTINSP                |          |
| 7A08             | INSPEVNT   | UWLASTINSP                |          |
| 7A08             | INSPEVNT   | OSLASTINSP                |          |
| 7A09, IS13       | INSPEVNT   | BRINSPFREQ                | E01      |
| 7A09, IS13       | INSPEVNT   | BRINSPFREQ                | S02      |
| 7A09, IS13       | INSPEVNT   | BRINSPFREQ                | T02      |
| 7A09             | INSPEVNT   | FCINSPFREQ                | J05      |
| 7A09             | INSPEVNT   | UWINSPFREQ                | W03      |
| 7A09             | INSPEVNT   | OSINSPFREQ                | E01      |

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### Crystal Reports Tables for BMS2 Items

| BMS2Code | Table Name | Column Name                | BMS Code |
|----------|------------|----------------------------|----------|
| 7A09     | INSPEVNT   | ELINSPFREQ                 | E01      |
| 7A10     | INSPEVNT   | NEXTINSP                   | E05      |
| 7A10     | INSPEVNT   | FCNEXTDATE                 | E05      |
| 7A10     | INSPEVNT   | UWNEXTDATE                 | E05      |
| 7A10     | INSPEVNT   | OSNEXTDATE                 | E05      |
| 7A10     | INSPEVNT   | ELNEXTDATE                 | E05      |
| 7A11     | BRIDGE     | NEXTINSPID                 |          |
| 7A12     | BRIDGE     | CREWHRS                    | E09      |
| 7A12     | BRIDGE     | CREWHRS                    | T09      |
| 7A12     | BRIDGE     | CREWHRS                    | S14      |
| 7A13     | BRIDGE     | SNOOPERHRS                 | E10      |
| 7A14     | BRIDGE     | BRIDGEGROUP                | E02      |
| 7A15     | BRIDGE     | FLAGGERHRS                 |          |
| 7A16     | BRIDGE     | SPCREWHRS                  | E09      |
| 7A17     | BRIDGE     | HELPERHRS                  |          |
| 7A18     | BRIDGE     | SPEQUIPHRS                 | E09      |
| AP01     | USERPROJ   | MPMS_Project_Num           | O01      |
| AP01     | USERPROJ   | MPMS_PROJECT_NUM           | O01      |
| AP07     | USERPROJ   | ECMS_Num                   | O04      |
| AP08     | USERPROJ   | Fed_Project_Num_1          | O25      |
| AP08     | USERPROJ   | Fed_Project_Num_2          | O26      |
| AP08     | USERPROJ   | Fed_Project_Num_3          | O26      |
| AP13     | USERPROJ   | DESIGN_TIP                 | O11      |
| AP15     | USERPROJ   | State_Project_Num          | O07      |
| AP17     | USERPROJ   | Let_Date                   | O17      |
| AP18     | USERPROJ   | Award_Date                 | O18      |
| AP19     | USERPROJ   | NTP_Date                   | O19      |
| AP21     | USERPROJ   | OPEN_Date                  | O21      |
| AP23     | USERPROJ   | Cost_Study_Apv_Cost        | O28      |
| AP23     | USERPROJ   | Cost_Study_Est_Cost        | O27      |
| AP24     | USERPROJ   | Prel_Design_Apv_Cost       | O30      |
| AP24     | USERPROJ   | Prel_Design_Est_Cost       | O29      |
| AP24     | USERPROJ   | PREL DESIGN ROUGH EST COST | F19      |
| AP25     | USERPROJ   | ROW_Apv_Cost               | O32      |
| AP25     | USERPROJ   | ROW_Est_Cost               | O31      |
| AP26     | USERPROJ   | Util_Apv_Cost              | O34      |
| AP26     | USERPROJ   | Util_Est_Cost              | O33      |
| AP27     | USERPROJ   | Final_Design_Apv_Cost      | O36      |
| AP27     | USERPROJ   | Final_Design_Est_Cost      | O35      |
| AP28     | USERPROJ   | Const_Apv_Cost             | O38      |
| AP28     | USERPROJ   | Const_Est_Cost             | O37      |
|          | USERPROJ   | Bridge_Bill_Num            | O12      |
|          | USERPROJ   | DRAWING_NUM                | G03      |
|          | USERPROJ   | Project_Class              | O09      |
| FR01     | USERRWAY   | RR_Name                    | B13      |
| FR02     | USERRWAY   | ON_UNDER                   |          |
| FR03     | USERRWAY   | RR_Serv_Status             | B13      |
| FR04     | USERRWAY   | RR_MILEPOST                | B15      |
| FR05     | USERRWAY   | AAR_DOT_No                 | B14      |
| FR06     | USERRWAY   | Elec_Track_Qty             | B12      |
| FR07     | USERRWAY   | LANES                      |          |
| FR08     | USERRWAY   | SPAN_DESC                  |          |
| FR09     | USERRWAY   | ADD_OPER_DESC              |          |
| FR10     | USERRWAY   | MIN_OVER_VERT_CLEAR_LEFT   | B22      |
| FR11     | USERRWAY   | MIN_OVER_VERT_CLEAR_RIGHT  | B22      |
| FR12     | USERRWAY   | TOT_HOR_CLEAR_LEFT         | B21      |
| FR13     | USERRWAY   | TOT_HOR_CLEAR_RIGHT        | B21      |
| FR14     | USERRWAY   | DEF_VERT_CLEAR_LEFT        | B23      |
| FR15     | USERRWAY   | DEF_VERT_CLEAR_RIGHT       | B23      |
| FR16     | USERRWAY   | NOTES                      |          |
| FT01     | T.Utility  | Utility_Name               | D02      |

## APPENDIX E

### Crystal Reports Tables for BMS2 Items

| BMS2Code | Table Name        | Column Name               | BMS Code          |
|----------|-------------------|---------------------------|-------------------|
| 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         | BRKEY                     | STRUCTURE_REF_NUM |
|          | T.Utility         | UTILITY_KEY               | D01               |
| FW01     | ROADWAY           | ROADWAY_NAME              | B03               |
| FW02     | ROADWAY           | ROADWAY_NAME              | D06               |
| 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          |                   |
| FW11     | USERRWAY          | MIN_OVER_VERT_CLEAR_RIGHT | D08               |
| 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      |                   |
| FW20     | USERRWAY          | NOTES                     |                   |
|          | USERRWAY          | CALC_SCOUR_DEPTH          | D12               |
|          | T.FC_Insp         | BRKEY                     | STRUCTURE_REF_NUM |
|          | T.FC_Insp         | FC_KEY                    | J_REF_NO          |
| 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               |
| IF06     | T.FC_Insp         | FC_Desc                   | J12               |
| IN01     | T.Underwater_Insp | STRUNITKEY                | W09               |
| IN02     | T.Underwater_Insp | PREVIOUS_CURRENT          | W13               |
| IN03     | T.Underwater_Insp | Obs_Scour_Rating          | W11A              |
| 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            |                   |
| IN14     | T.Underwater_Insp | Found_Type                | W10               |
| IN16     | T.Underwater_Insp | Underwater_Insp_Type      | W11B              |
| IN17     | T.Underwater_Insp | Obs_Scour_Depth           | W11C              |
| IN18     | T.Underwater_Insp | Max_Water_Depth           | W11               |
| IN19     | T.Underwater_Insp | MOVEMENT                  |                   |
| IN20     | T.Underwater_Insp | SCOUR_UNDERMINE           |                   |
| IN21     | T.Underwater_Insp | Countermeasures           | W11F              |

## APPENDIX E

### Crystal Reports Tables for BMS2 Items

| BMS2Code | Table Name        | Column Name              | BMS Code |
|----------|-------------------|--------------------------|----------|
| IN22     | T_Underwater_Insp | Calc_Scour_Depth_100     | W11D     |
| IN23     | T_Underwater_Insp | Calc_Scour_Depth_500     | W11E     |
| IN24     | T_Underwater_Insp | Underwater_Insp_Desc     | W12      |
| IR01A    | BRIDGE            | REQ_OP_RAT               |          |
| IR01B    | USERINSP          | LR REVIEW ACTION         |          |
| IR02     | USERINSP          | RATING_APPR_DATE         |          |
| IR04     | T_RATING_LOAD     | LOAD_TYPE                | E30      |
| IR04     | T_RATING_LOAD     | LOAD_TYPE                | E31      |
| IR05     | T_RATING_LOAD     | NBI_RATING_IND           |          |
| IR06     | T_RATING_LOAD     | Rating_Analysis_Method   | E32      |
| IR06     | T_RATING_LOAD     | Rating_Stress_Method     | E32      |
| IR07     | T_RATING_LOAD     | CONTROL_MEM_TYPE         | E33      |
| IR08     | T_RATING_LOAD     | Fatig_Stress_Cat         | E34      |
| IR09     | T_RATING_LOAD     | Fatig_Load_Type          | E35      |
| IR10     | T_RATING_LOAD     | IRLOAD                   | E30      |
| IR11     | T_RATING_LOAD     | ORLOAD                   | E31      |
| 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      |
| IR16     | T_RATING_LOAD     | ANALYSIS_ENGINEER        |          |
| IR17     | T_RATING_LOAD     | SUPPORT_DATASET          |          |
| IR18     | T_RATING_LOAD     | Stress_Range             | E36      |
| IR19     | T_RATING_LOAD     | NOTES                    |          |
| IS01     | INSPEVNT          | INSPTYPE                 | 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     | INSPEVNT          | STRATING                 | S30      |
| IS11     | USERINSP          | NOTES                    | S31      |
| IS12     | USERINSP          | NEXT_INSP_TYPE           | S02A     |
| IS13     | INSPEVNT          | BRINSPFREQ               | S02      |
| IS14     | INSPEVNT          | NEXTINSP                 |          |
| 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              |          |
| 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      |          |
| IU21     | T_SCOUR_CMEASURE  | CMEASURE_TYPE            |          |
| IU22     | T_SCOUR_CMEASURE  | CMEASURE_LOCATION        |          |

## APPENDIX E

### Crystal Reports Tables for BMS2 Items

| BMS2Code | Table Name            | Column Name            | BMS Code           |
|----------|-----------------------|------------------------|--------------------|
| IU23     | T_SCOUR_CMEASURE      | CMEASURE_COND          |                    |
| IU24     | T_SCOUR_CMEASURE      | PIER_NUM               |                    |
| IU27     | T_UNDERWATER_INSP     | SCBL_CODE              |                    |
| IU28     | T_UNDERWATER_INSP     | SCBL_CASE              |                    |
| IU29     | T_UNDERWATER_INSP     | SAR                    |                    |
| IW01     | INSPEVNT              | INSPTYPE               |                    |
| IW02     | T_WALL_INSP           | ANCHORAGE_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     | INSPEVNT              | STRATING               |                    |
| IW11     | INSPEVNT              | NOTES                  | T18                |
| IW11     | INSPEVNT              | NOTES                  | T19                |
| IW11     | INSPEVNT              | NOTES                  | T20                |
| IW11     | INSPEVNT              | NOTES                  | T21                |
| IW11     | INSPEVNT              | NOTES                  | T22                |
| IW11     | INSPEVNT              | NOTES                  | T23                |
| IW11     | INSPEVNT              | NOTES                  | T24                |
| IW12     | USERINSP              | NEXT_INSP_TYPE         |                    |
| IW13     | INSPEVNT              | BRINSPFREQ             | T02                |
| IW14     | INSPEVNT              | NEXTINSP               |                    |
|          | T_WALL_INSP           | BRKEY                  | STRUCTURE_REF_NUM  |
| SC03     | T_APRAIS_CLEAR        | Non_Res_Vert_Clear     | NON_RES_CLR        |
| SC04     | T_APRAIS_CLEAR        | Non_Res_Review         | NON_RES_CLR_RE_IND |
| SC05     | T_APRAIS_CLEAR        | Min_Travel_Width_Left  | TRVL_WIDTH_LE      |
| SC06     | T_APRAIS_CLEAR        | Min_Travel_Width_Right | TRVL_WIDTH_RG      |
| SC07     | T_APRAIS_CLEAR        | ON_CLEAR_COND1         | PERMIT_CODE        |
| SC07     | T_APRAIS_CLEAR        | ON_CLEAR_COND2         | PERMIT_CODE        |
| SC07     | T_APRAIS_CLEAR        | ON_WEIGHT_COND1        | PERMIT_CODE        |
| SC07     | T_APRAIS_CLEAR        | ON_WEIGHT_COND2        | PERMIT_CODE        |
| SC07     | T_APRAIS_CLEAR        | ON_WEIGHT_COND3        | PERMIT_CODE        |
| SC07     | T_APRAIS_CLEAR        | UNDER_CLEAR_COND1      | PERMIT_CODE        |
| SC07     | T_APRAIS_CLEAR        | UNDER_CLEAR_COND2      | PERMIT_CODE        |
| SC08     | T_APRAIS_CLEAR        | ON_CLEAR_COND_DESC1    | NAR_REF_TEXT       |
| SC08     | T_APRAIS_CLEAR        | ON_CLEAR_COND_DESC2    | NAR_REF_TEXT       |
| SC08     | T_APRAIS_CLEAR        | ON_WEIGHT_COND_DESC1   | NAR_REF_TEXT       |
| SC08     | T_APRAIS_CLEAR        | ON_WEIGHT_COND_DESC2   | NAR_REF_TEXT       |
| SC08     | T_APRAIS_CLEAR        | ON_WEIGHT_COND_DESC3   | NAR_REF_TEXT       |
| SC08     | T_APRAIS_CLEAR        | UNDER_CLEAR_COND_DESC1 | NAR_REF_TEXT       |
| SC08     | T_APRAIS_CLEAR        | UNDER_CLEAR_COND_DESC2 | NAR_REF_TEXT       |
| SC09     | T_APRAIS_CLEAR_DETAIL | HOR_CLEAR              | HORZ_1_CLEAR       |
| SC09     | T_APRAIS_CLEAR_DETAIL | HOR_CLEAR              | HORZ_2_CLEAR       |
| SC09     | T_APRAIS_CLEAR_DETAIL | HOR_CLEAR              | HORZ_3_CLEAR       |
| SC09     | T_APRAIS_CLEAR_DETAIL | HOR_CLEAR              | HORZ_4_CLEAR       |
| SC10     | T_APRAIS_CLEAR_DETAIL | VERT_Clear             | VERT_1_CLEAR       |
| SC10     | T_APRAIS_CLEAR_DETAIL | VERT_Clear             | VERT_2_CLEAR       |
| SC10     | T_APRAIS_CLEAR_DETAIL | VERT_Clear             | VERT_3_CLEAR       |
| SC10     | T_APRAIS_CLEAR_DETAIL | VERT_Clear             | VERT_4_CLEAR       |
|          | T_APRAIS_CLEAR        | BRKEY                  | STRUCTURE_REF_NUM  |
|          | T_APRAIS_CLEAR_DETAIL | BRKEY                  | STRUCTURE_REF_NUM  |
|          | T_APRAIS_CLEAR_DETAIL | CLEARKEY               | APRAS_CLR_COUNTER  |
|          | T_APRAIS_RATING       | BRKEY                  | STRUCTURE_REF_NUM  |
|          | T_APRAIS_RATING       | MODTIME                | LAST_UPDATED       |
| SL01     | T_APRAIS_RATING       | Rating_Date            | COMP_RATINGS_D     |
| SL02     | T_APRAIS_RATING       | Control_Member         | CONTROLLING_MEM    |
| SL03     | T_APRAIS_RATING       | AASHTO_Spec_Year       | AASHTO_SPECS       |
| SL05     | T_APRAIS_RATING       | Percent_Deter          | PERCENT_DETER      |

## APPENDIX E

### Crystal Reports Tables for BMS2 Items

| BMS2Code | Table Name             | Column Name            | BMS Code          |
|----------|------------------------|------------------------|-------------------|
| SL06     | T_APRA_S_RATING        | Fatig_Cat              | FATIG_CATEGORY    |
| SL07     | T_APRA_S_RATING        | Fatig_Stress_Range     | STRESS_RANGE      |
| SL08     | T_APRA_S_RATING        | MOMENT_NORMAL          | MOMENT_NORM       |
| SL09     | T_APRA_S_RATING        | MOMENT_SINGLE          | MOMENT_SINGLE     |
| SL10     | T_APRA_S_RATING        | SHEAR_NORMAL           | SHEAR_NORM        |
| SL11     | T_APRA_S_RATING        | SHEAR_SINGLE           | SHEAR_SINGLE      |
| SL12     | T_APRA_S_RATING        | POS_MOM_COMP_FACT_NORM | MOM_COMP_FACT1    |
| SL13     | T_APRA_S_RATING        | POS_MOM_COMP_FACT_REST | MOM_COMP_FACT2    |
| SL14     | T_APRA_S_RATING        | NEG_MOM_Comp_Fact_Norm | MOM_COMP_COMM1    |
| SL15     | T_APRA_S_RATING        | Neg_Mom_Comp_Fact_Rest | MOM_COMP_COMM2    |
| SL16     | T_APRA_S_RATING        | Load_Cond1             | LOAD_COND1_I      |
| SL16     | T_APRA_S_RATING        | Load_Cond2             | LOAD_COND1_2      |
| SL17     | T_APRA_S_RATING        | SINGLE_LANE_SPAN_ID    | SN_LANE_SPANID    |
| SL18     | T_APRA_S_RATING        | Restrict_Span_ID1      | PC12              |
| SL19     | T_APRA_S_RATING        | Restrict1              | PC13              |
| SL19     | T_APRA_S_RATING        | Restrict2              | PC13              |
| SL19     | T_APRA_S_RATING        | Restrict3              | PC13              |
| SL20     | T_APRA_S_RATING        | Restrict_Span_ID2      | PC14              |
| SL21     | T_APRA_S_RATING        | Restrict4              | PC15              |
| SL21     | T_APRA_S_RATING        | Restrict5              | PC15              |
| SL21     | T_APRA_S_RATING        | Restrict6              | PC15              |
| SL21     | T_APRA_S_RATING        | Restrict7              | PC15              |
| SL22     | T_APRA_S_RATING        | RATING_NOTES           | NAR_TEXT          |
| SL25     | T_APRA_S_RATING_DETAIL | ANALYSIS_METHOD        | SPAN_INV_RATEM    |
| SL25     | T_APRA_S_RATING_DETAIL | ANALYSIS_METHOD        | SPAN_OPR_RATEM    |
| SL26     | T_APRA_S_RATING_DETAIL | INV_LOAD_RATE          | SPAN_INV_RATE     |
| SL27     | T_APRA_S_RATING_DETAIL | OPR_LOAD_RATE          | SPAN_OPR_RATE     |
|          | T_APRA_S_RATING_DETAIL | BRKEY                  | STRUCTURE_REF_NUM |
|          | T_APRA_S_RATING_DETAIL | DESIGN_METHOD          | SPAN_INV_RATEM    |
|          | T_APRA_S_RATING_DETAIL | DESIGN_METHOD          | SPAN_OPR_RATEM    |
|          | T_APRA_S_RATING_DETAIL | RATINGKEY              | APRAS_INV_COUNTER |
|          | T_APRA_S_RATING_DETAIL | RATINGKEY              | APRAS_OPR_COUNTER |
|          | T_APRA_S_SPAN          | BRKEY                  | STRUCTURE_REF_NUM |
| SS02     | T_APRA_S_SPAN          | SPAN_ID_SUFFIX         | ID_NO             |
| SS02     | T_APRA_S_SPAN          | SPAN_ID_SUFFIX         | SPAN_NO           |
| SS04     | T_APRA_S_SPAN          | C_C_SPAN_LENGTH        | C_C_SPAN_LTH      |
| SS07     | T_APRA_S_SPAN          | BEGIN_Cont_STRUNITKEY  | CONTINUOUS1       |
| SS08     | T_APRA_S_SPAN          | END_Cont_STRUNITKEY    | CONTINUOUS2       |
| SS09     | T_APRA_S_SPAN          | Mom_Comp_Span_Length   | MOM_COMP_SP_LT    |
| SS10     | T_APRA_S_SPAN          | DEPT_MATERIAL_TYPE     | STRUC_TYP_DEPT    |
| SS10     | T_APRA_S_SPAN          | DEPT_PHYSICAL_TYPE     | STRUC_TYP_DEPT    |
| SS10     | T_APRA_S_SPAN          | DEPT_SPAN_INTERACTION  | STRUC_TYP_DEPT    |
| SS10     | T_APRA_S_SPAN          | DEPT_STRUC_CONFIG      | STRUC_TYP_DEPT    |
| SS11     | USERBRDG               | APRAS_REF              | APRAS_REF         |
| SS12     | USERBRDG               | APRAS_MAX_AXLE_WEIGHT  | AXLE_WEIGHT       |
| SS13     | USERBRDG               | TOTAL_APRA_S_SPAN_QTY  |                   |
| VA01     | T_Paint                | Paint_Date             | G09               |
| VA02     | T_Paint                | Extent                 | 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                | BRKEY                  | STRUCTURE_REF_NUM |

## APPENDIX E

### Crystal Reports Tables for BMS2 Items

| BMS2Code | Table Name        | Column Name             | BMS Code          |
|----------|-------------------|-------------------------|-------------------|
|          | T_Paint           | PAINT_KEY               | G08               |
| VD01     | USERBRDG          | Design_Method           | C04               |
| VD02     | USERBRDG          | Live_Load_Cont          | C35               |
| VD03     | USERBRDG          | BEAM_GEOM               | C11               |
| VD04     | USERBRDG          | Steel_Beam_Splice_Type  | C24               |
| VD05     | T_Steel_Type      | Steel_Type              | C12               |
|          | T_Steel_Type      | BRKEY                   | STRUCTURE_REF_NUM |
|          | T_Steel_Type      | Steel_Type_key          | STL_COUNTER       |
| 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               |
| VD12     | T_Void_Type       | Void_Type               | C33               |
|          | T_Void_Type       | BRKEY                   | STRUCTURE_REF_NUM |
|          | T_Void_Type       | Void_KEY                | VOID_TYPE_COUNTER |
| VD13     | T_STRAND_SIZE     | STRAND_SIZE             | C28               |
|          | T_STRAND_SIZE     | BRKEY                   | STRUCTURE_REF_NUM |
|          | T_STRAND_SIZE     | Strand_SIZE_KEY         | STR_COUNTER       |
| 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               |
| VD16     | T_PIER_TYPE       | PIER_CONFIG_TYPE        | C39               |
| VD16     | T_PIER_TYPE       | PIER_MATERIAL_TYPE      | C39               |
|          | T_PIER_TYPE       | BRKEY                   | STRUCTURE_REF_NUM |
|          | T_PIER_TYPE       | PIER_TYPE_KEY           | PIR_COUNTER       |
| VD17     | T_Pier_Found_Type | Pier_Found_Type         | C40               |
|          | T_Pier_Found_Type | BRKEY                   | STRUCTURE_REF_NUM |
|          | T_Pier_Found_Type | Pier_Found_TYPE_Key     | PFD_COUNTER       |
| 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              |                   |
| 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       | BRKEY                   | STRUCT_REF_NUM    |
|          | T_Exp_Joint       | EXP_JOINT_KEY           | EXP_COUNTER       |
| VD28     | USERBRDG          | Haunch_Type             | C32               |
| VD28     | USERBRDG          | Haunch_Type             | C32               |
| VD29     | USERBRDG          | Spec_Pier_Cap_Type      | C41               |
| VD30     | T_BEARING_TYPE    | Bearing_Type            | C23               |
|          | T_BEARING_TYPE    | Bearing_typekey         | BRG_COUNTER       |
|          | T_BEARING_TYPE    | BRKEY                   | STRUCTURE_REF_NUM |
| VI01     | USERBRDG          | MIN_CRANE_REACH         |                   |
| VI02     | USERBRDG          | HVPL                    | E05               |
| VI03     | USERBRDG          | RR_FLAGGING             |                   |
| VI04     | USERBRDG          | TRAF_FLAGGIN            |                   |
| VI05     | USERBRDG          | SIDEWALK_TYPE_LEFT      | A34               |
| VI06     | USERBRDG          | SIDEWALK_TYPE_RIGHT     | A34               |
| VI07     | BRIDGE            | LFTCURBSW               | A34               |
| VI08     | BRIDGE            | RTCURBSW                | A34               |

## APPENDIX E

### Crystal Reports Tables for BMS2 Items

| BMS2Code   | Table Name         | Column Name                | BMS Code           |
|------------|--------------------|----------------------------|--------------------|
| VI09       | USERBRDG           | HOR_CURVE                  | A36                |
| VI10       | USERBRDG           | Vert_Curve                 | A36                |
| VI11       | T_INSP_EQUIP       | EQUIP_KEY                  | A36                |
| VI12       | T_INSP_EQUIP       | EQUIP_TYPE                 | E03                |
| VI12       | T_INSP_EQUIP       | EQUIP_TYPE                 | S04                |
| VI13       | T_INSP_EQUIP       | EQUIP_QTY                  |                    |
| VI14       | T_INSP_EQUIP       | CONSUMABLE                 |                    |
| VI15       | T_INSP_EQUIP       | ASSIGNED_TO                |                    |
| VI16       | T_INSP_EQUIP       | NOTES                      |                    |
| VI17       | T_INSP_PERMIT      | PERMIT_KEY                 |                    |
| VI18       | T_INSP_PERMIT      | PERMIT_TYPE                |                    |
| VI19       | T_INSP_PERMIT      | ISSUING_AUTH               |                    |
| 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                      |                    |
| VM01       | USERBRDG           | LEG_ACT_NUM                | A21                |
| VM02, VW34 | USERBRDG           | Maint_Resp_Desc            | A22                |
| 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         |                    |
|            | T_Maint_Resp       | BRKEY                      | STRUCTURE_REF_NUM  |
|            | T_Maint_Resp       | Maint_Resp_Key             | MAINT_CODE_COUNTER |
| VN01       | T DESIGN_EXCEPTION | Design_Exception           | A12                |
| VN02       | USERBRDG           | SOIL_BORING_NOTES          |                    |
| VN03       | USERBRDG           | MEM_PROP_TEST              |                    |
| VN04       | USERBRDG           | STORAGE_LOC                |                    |
| VN05       | T_DRAWING          | DRAWING_NUM                | A15                |
| VN05       | T_DRAWING          | DRAWING_NUM                | A14                |
| VN06       | T_DRAWING          | DRAWING_NUM                | A15                |
| VN06       | T_DRAWING          | DRAWING_DESC               | A15                |
| VN07       | T_DRAWING          | DRAWING_NUM                | G03                |
| VN07       | T_DRAWING          | DRAWING_DESC               | G03                |
|            | T_POSTING          | BRKEY                      | STRUCTURE_REF_NUM  |
|            | T_POSTING          | POSTING_KEY                | POSTING_COUNTER    |
| VP01       | T_POSTING          | Post_Status_Date           | D16                |
| VP01       | T_POSTING          | Post_Status_Date           | D17                |
| 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                |
| VS01       | USERBRDG           | DEPT_MAIN_MATERIAL_TYPE    | S12                |
| VS02       | USERBRDG           | DEPT_MAIN_PHYSICAL_TYPE    | S12                |
| VS03       | USERBRDG           | DEPT_MAIN_SPAN_INTERACTION | S12                |
| VS04       | USERBRDG           | DEPT_MAIN_STRUC_CONFIG     | S12                |
| VS05       | T_SIGN_LIGHT       | MOUNT_TYPE                 |                    |
| VS06       | T_SIGN_LIGHT       | FOUND_MATERIAL_TYPE        |                    |
| VS07       | T_SIGN_LIGHT       | MANUFACTURER               |                    |
| VS08       | T_SIGN_LIGHT       | INSP_LOC                   |                    |
| VS09       | BRIDGE             | YEARBUILT                  | A16                |
| VS10       | BRIDGE             | YEARRECON                  | A17                |
| VS11       | T_Sign_LIGHT       | Sign_Qty                   | S13                |
| VS12       | T_SIGN_LIGHT       | LIGHT_QTY                  |                    |
| VS13       | T_SIGN_LIGHT       | PA_COUNTY                  | A01                |
| VS14       | T_SIGN_LIGHT       | SR_NUM                     | A01                |

## APPENDIX E

### Crystal Reports Tables for BMS2 Items

| BMS2Code | Table Name   | Column Name                | BMS Code          |
|----------|--------------|----------------------------|-------------------|
| VS15     | T_SIGN_LIGHT | SEG_NUM                    | A01               |
| VS16     | T_SIGN_LIGHT | OFFSET                     | A01               |
| 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             |                   |
| VS25     | T_Sign_LIGHT | Tot_Sign_Area              | S05               |
| VS26     | T_Sign_LIGHT | Max_Column_Height          | S19               |
| VS27     | BRIDGE       | LENGTH                     | S21               |
| VS28     | T_Sign_LIGHT | Span_Qty                   | S20               |
| VS29     | BRIDGE       | SUMLANES                   | S20A              |
| VS30     | T_Sign_LIGHT | Median_Width               | S21               |
| VS31     | BRIDGE       | NOTES                      |                   |
| VS32     | BRIDGE       | OWNER                      | A20               |
| VS33     | USERBRDG     | MAIN_RESP_DESC             | A22               |
| VW01     | USERBRDG     | DEPT_MAIN_MATERIAL_TYPE    | T08               |
| VW02     | USERBRDG     | DEPT_MAIN_PHYSICAL_TYPE    | T08               |
| VW03     | USERBRDG     | DEPT_MAIN_SPAN_INTERACTION | T08               |
| VW04     | USERBRDG     | DEPT_MAIN_STRUC_CONFIG     | T08               |
| 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                  |                   |
| VW13     | T_WALL       | YEARBUILT                  | A16               |
| VW14     | T_WALL       | YEARRECON                  | A17               |
| 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               |
| VW22     | T_WALL       | BEGIN_ROUTENUM             | A01               |
| VW23     | T_WALL       | BEGIN_SEG_NUM              | A01               |
| VW24     | T_WALL       | BEGIN_OFFSET               | A01               |
| VW25     | T_WALL       | ROAD_DISTANCE              |                   |
| VW26     | T_WALL       | Backfill_Slope             | T12               |
| VW27     | T_WALL       | MIN_CLEARANCE              |                   |
| VW28     | T_WALL       | Min_Height                 | T04               |
| VW29     | T_WALL       | Min_Height                 | T04               |
| VW30     | T_WALL       | Max_Height                 | T05               |
| VW31     | T_WALL       | Max_Height                 | T05               |
| VW31     | T_Wall       | Wall_Surface_Area          | T07               |
| VW32     | T_WALL       | NOTES                      | T18               |
| VW32     | T_WALL       | NOTES                      | T19               |
| VW32     | T_WALL       | NOTES                      | T20               |
| VW32     | T_WALL       | NOTES                      | T21               |
| VW32     | T_WALL       | NOTES                      | T22               |
| VW32     | T_WALL       | NOTES                      | T23               |
| VW32     | T_WALL       | NOTES                      | T24               |
| VW33     | BRIDGE       | OWNER                      | A20               |
| VW34     | USERBRDG     | MAINT_RESP_DESC            | A22               |
|          | T_Wall       | BRKEY                      | STRUCTURE_REF_NUM |

## APPENDIX E

### Crystal Reports Tables for BMS2 Items

| BMS2Code | Table Name          | Column Name    | BMS Code          |
|----------|---------------------|----------------|-------------------|
|          | ELEMINSPI           | ELEMINSPI      | STRUCT_REF_NUM    |
|          | INSP_WCAND          | BRKEY          | STRUCTURE_REF_NUM |
|          | INSPEVNT, ELEMINSPI | BRKEY          | STRUCT_REF_NUM    |
|          | PRJ_WITEMS          | ACTCODE        | N02               |
|          | PRJ_WITEMS          | BRKEY          | STRUCTURE_REF_NUM |
|          | PRJ_WITEMS          | COST           | N06               |
|          | PRJ_WITEMS          | COST           | G05               |
|          | PRJ_WITEMS          | NOTES          | N08               |
|          | PRJ_WITEMS          | NOTES          | G07               |
|          | PRJ_WITEMS          | QUANTITY       | N05               |
|          | PRJ_WITEMS          | REPAIR_PROGRAM | G06               |
|          | PRJ_WITEMS          | WORKASSIGNMENT | N07               |
|          | PROJECTS            | FINALCOST      | G05               |
|          | PROJECTS            | NOTES          | O44               |
|          | PROJECTS            | NOTES          | O45               |
|          | PROJECTS            | NOTES          | F26               |
|          | PROJECTS            | PROJ_STATUS    | O10               |
|          | PROJECTS            | PROJECT_ID     | O06               |
|          | PROJECTS            | PROJECTENDDATE | O20               |
|          | PROJECTS            | PROJENDDATE    | N01               |
|          | PROJECTS            | PROJKEY        | G01               |

## **Appendix F**

### **D-491 Forms**

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**D-491 1A**  
Commonwealth of Pennsylvania  
Department of Transportation

**BRIDGE MANAGEMENT SYSTEM2**  
**INSPECTION CONDITION CARD**

**7A01** Inspection Date:

CO

SR

**5A01**

SEG

OFF

**5A03**

BRKEY

**NBI Rating:**

**1A01** Deck:

**1A02** Substructure:

**1A03** Culvert:

**1A04** Superstructure:

**1A05** Channel:

**1A06** Waterway:

**1A07** Unrep Spalls:  (SF)

**1A08** Rev Needed:

Status:

**Key:**

**Structure Unit ID:**

**Type:**

**1B01**

**Elem/  
Env**

**Element  
Description**

**1A10**

Qty

UOM

**1A11**

Qty1

**1A11**

Qty2

**1A11**

Qty3

**1A11**

Qty4

**1A11**

Qty5

|                      |                      |                      |                      |                      |                      |                      |                      |
|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| <input type="text"/> |
|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|

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D-491 1B  
Commonwealth of Pennsylvania  
Department of Transportation

BRIDGE MANAGEMENT SYSTEM2  
ELEMENT INSPECTION CONDITION CARD

7A01 Inspection Date:  CO  SR  SEG  OFF  BRKEY

Structure Unit Key: Structure Unit ID: Type:

Elem / Env:  1B01 Element Description:   
1A10 Qty:  1A11 Qty1:  1A11 Qty2:   
1A11 Qty3:  1A11 Qty4:  1A11 Qty5:

1A12 Elem  
Cond:

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D-491 2A  
Commonwealth of Pennsylvania  
Department of Transportation

**BRIDGE MANAGEMENT SYSTEM2**  
**INSPECTION NOTES**

**7A01** Inspection Date:

**5A01**  **CO**  **SR**  **SEG**  **OFF**   
**5A03**  **BRKEY**

**2A01 Str Notes**

**2A02 Insp Notes**

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D-491 3A  
Commonwealth of Pennsylvania  
Department of Transportation

BRIDGE MANAGEMENT SYSTEM2  
INSPECTION WORK CARD

7A01 Inspection Date:

CO

SR

5A01

SEG

OFF

5A03

BRKEY

3A01 Type: Unk

3A02 Card ID:

3A03 Structure Unit:

3A04 Estimated Quantity: N/A

3A05 Element: N/A

3A06 Action:

3A07 Estimated Cost:

3A08 Priority:

3A09 Date Recomm:

3A11 Target Year:

3A12 Assigned:

3A13 Work Assign:

3A14 Status:

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D-491 4A  
Commonwealth of Pennsylvania  
Department of Transportation

BRIDGE MANAGEMENT SYSTEM2  
APPRAISAL CARD - OTHER RATINGS

**7A01** Inspection Date:

CO      SR      SEG      OFF      BRKEY

**5A01**

**5A03**

**Structure Appraisal:**

- 4A01** Open/Posted/Closed:   
**4A02** Approach Alignment:   
**4A03** Bridge Railings:   
**4A04** Transitions:   
**4A05** Approach Guardrail:   
**4A06** Appr Guardrail Ends:   
**4A07** Pier Protection:   
**4A08** Scour Critical:

**NBI Appraisal Ratings - calculated:**

- 4A09** Structural Eval:   
**4A10** Deck Geometry:   
**4A11** Underclearances:   
**4A12** SD/FO Status:   
**4A13** Sufficiency Rating:   
**4A14** Health Index:

**Minimum Vertical Clearance:**

- 4A15** Over Structure:   
**4A16** Under (Reference):   
**4A17** Under Clearance:  ft

**Minimum Lateral Underclearances:**

- 4A18** Reference Feature:   
**4A19** Right Side:  ft  
**4A20** Left Side:  ft

**Navigation Data:**

- 4A21** Nav Control Exists:   
**4A22** Nav Vertical Clr:  ft

- 4A23** Nav Horizontal Clr:  ft  
**4A24** Min Vert Lft Clr:  ft

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**D-491 5A**  
Commonwealth of Pennsylvania  
Department of Transportation

**BRIDGE MANAGEMENT SYSTEM2**  
**INSPECTION INVENTORY - ID / ADMIN**

**7A01** Inspection Date:

**5A01** CO  SR  SEG  OFF   
**5A03** BRKEY

**Structure Identification:**

**5A01** Structure Id:

**5A02** Name:

**5A03** NBI Structure No:

**Location:**

**5A04** District:

**5A05** County:

**5A06** City/Town/Place:

**5A07** Feature Intersected:

**5A08** Facility Carried:

**5A09** Location:

**5A10** Lat/ **5A11** Long:

**5A12** Bord St/FHWA Reg:

Share:  %

**5A13** Border Struc No:

**5A14** FIPS State/Region:

**Age and Service:**

**5A15** Year Built:

**5A16** Year Reconstruct:

**5A17** Type of Service On:

**5A18** Under:

**5A19** # Lanes Under:

**Management:**

**5A20** Maint Resp:

**5A21** Owner:

**5A22** On/Off Agency Sys:

**7A13** Next Inspected By:

**5A23** Agency Admin Area:

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BRIDGE MANAGEMENT SYSTEM2  
INSPECTION INVENTORY - DESIGN

7A01 Inspection Date:

5A01      CO      SR      SEG      OFF      5A03  
                    BRKEY

**Deck Information:**

5B01 Deck Structure Type:

5B02 Deck Surface Type:

5B03 Deck Membrane Type:

5B04 Deck Protection:

Curb/Sidewalk Width: 5B05 Left:  ft

5B06 Right:  ft

5B07 Deck Width:  ft

5B08 Bridge Median:

5B09 Skew:  degrees

5B10 Structure Flared:

**Span Information:**

5B11 Number of Main Spans:

5B12 Main Span Material:

5B13 Main Span Design:

5B14 Number of Approach Spans:

5B15 Approach Span Material:

5B16 Approach Span Design:

5B17 Max Span Length:  ft

5B18 Structure Length:  ft

5B19 Deck Area:  (SF)

5B20 Total Length:  ft

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5A01

CO

SR

SEG

OFF

5A03

BRKEY

7A01 Inspection Date: [ ]

Roadway Identification:

5C01 Route Name: [ ]

5C02 NBI Roadway:

5C03 Position/Prefix: [ ]

5C04 Kind Hwy (Rt Pref): [ ]

5C05 Design Lvl Service: [ ]

5C06 Rte #/Suffix: [ ] [ ]

5C07 Critical Facility: [ ]

Traffic and Accidents:

5C08 Lanes: [ ] Medians:  Speed: [ ] mph

5C09 ADT Class: [ ]

5C10 Recent ADT: [ ]

5C11 Year: [ ]

5C12 Future ADT: [ ]

5C13 Year: [ ]

5C14 Truck %ADT: [ ]

5C15 Detour Leng: [ ] mi 5C16 Speed: [ ] 0 mph

5C17 Accident Cnt: [ ] 0 Rate: [ ]

Highway Networks and Service Classifications:

5C18 Kilometer / Mile Pt: [ ] mi

5C19 Nat Base Net: [ ]

5C20 LRS Inventory Rt: [ ] Sub#:

5C21 Toll Facility: [ ]

5C22 Functional Class: [ ]

5C23 Traffic Direction: [ ]

Clearances:

5C24 Vertical: [ ] .0 ft 5C26 Appr Road: [ ] .0 ft

5C25 Horiz: [ ] .0 ft 5C27 Roadway: [ ] .0 ft

Alternate Classifications:

5C28 Defense Hwy: [ ]

5C29 Nat Hwy Sys: [ ] 5C30 SB:

5C31 Fed Lands Hwy: [ ] 5C32 Trans:

5C33 Nat Truck Network: [ ] 5C34 Emer:

Agency Roadway Fields:

5C35 1: [ ]

5C38 4: [ ]

5C36 2: [ ]

5C39 5: [ ]

5C37 3: [ ]

Notes: [ ]

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**BRIDGE MANAGEMENT SYSTEM2**  
**AGENCY BRIDGE**

**7A01** Inspection Date:

|    |    |     |     |       |
|----|----|-----|-----|-------|
| CO | SR | SEG | OFF | BRKEY |
|----|----|-----|-----|-------|

**5A01**

**5A03**

**General**

|                                                                   |                                                                  |
|-------------------------------------------------------------------|------------------------------------------------------------------|
| <b>6A01</b> Senat Dist: <input type="text"/> <input type="text"/> | <b>6A02</b> Cong Dist: <input type="text"/> <input type="text"/> |
| <b>6A03</b> Leg Dist: <input type="text"/> <input type="text"/>   |                                                                  |
| <b>6A04</b> Bndy: <input type="text"/>                            | <b>6A05</b> Util Pres: <input type="checkbox"/>                  |
| <b>6A06</b> Sub Agency: <input type="text"/>                      |                                                                  |
| <b>6A07</b> Fed Fund: <input type="text"/>                        |                                                                  |
| <b>6A08</b> Dept Struc Len: <input type="text"/>                  | <b>6A09</b> Fract Crit: <input type="checkbox"/>                 |
| <b>6A10</b> Flood Insp: <input type="checkbox"/>                  | <b>6A11</b> Covr Brdg: <input type="checkbox"/>                  |
| <b>6A12</b> Dem/Repl Ind: <input type="checkbox"/>                | <b>6A13</b> Dem/Repl Dt: <input type="text"/>                    |
| <b>6A14</b> Hist Dist Cont: <input type="checkbox"/>              | <b>6A15</b> Hist Dist: <input type="text"/>                      |
| <b>6A16</b> Preserv Cand: <input type="checkbox"/>                | <b>6A17</b> Future Brdg Bill: <input type="checkbox"/>           |
| <b>6A18</b> Network: <input type="text"/>                         |                                                                  |
| <b>6A19</b> Bus Plan Ntk: <input type="text"/>                    |                                                                  |
| <b>6A20</b> Watershed: <input type="text"/>                       |                                                                  |
| <b>6A21</b> Deice Equip: <input type="text"/>                     |                                                                  |
| <b>6A22</b> Corridor: <input type="text"/>                        |                                                                  |
| <b>6A23</b> Owner Desc: <input type="text"/>                      |                                                                  |
| <b>6A24</b> Trnback Desc: <input type="text"/>                    |                                                                  |

**Structure Type**

| Main                                            | Approach             |
|-------------------------------------------------|----------------------|
| <b>6A26</b> Material: <input type="text"/>      | <input type="text"/> |
| <b>6A27</b> Physical: <input type="text"/>      | <input type="text"/> |
| <b>6A28</b> Span Interact: <input type="text"/> | <input type="text"/> |
| <b>6A29</b> Struct Config: <input type="text"/> | <input type="text"/> |

**Deck Wearing Surface Info**

| Main                                                                           | Approach                |
|--------------------------------------------------------------------------------|-------------------------|
| <b>5B02/6A30</b> Surf: <input type="text"/>                                    | <input type="text"/>    |
| <b>5B03/6A31</b> Memb: <input type="text"/>                                    | <input type="text"/>    |
| <b>5A21/6A32</b> Protect: <input type="text"/>                                 | <input type="text"/>    |
| <b>6A33</b> Thickness: <input type="text"/> in                                 | <input type="text"/> in |
| <b>6A34</b> Dt Recorded: <input type="text"/>                                  |                         |
| <b>6A35</b> Surf Thick (over/under): <input type="text"/> <input type="text"/> |                         |
| <b>6A36</b> Protect Year: <input type="text"/>                                 |                         |
| <b>6A37</b> Protect Note: <input type="text"/>                                 |                         |

**Deck Info**

|                                                 |                                                    |
|-------------------------------------------------|----------------------------------------------------|
| <b>6A38</b> Dept Structyp: <input type="text"/> | <b>6A39</b> Relief Joint: <input type="checkbox"/> |
| <b>6A40</b> Form Type: <input type="text"/>     | <b>6A41</b> No of Joints: <input type="text"/>     |
| <b>6A42</b> Rebar Type: <input type="text"/>    |                                                    |
| <b>6A43</b> Appr Pav Wdth: <input type="text"/> |                                                    |

**Latent Problem**

|                                             |                                             |
|---------------------------------------------|---------------------------------------------|
| <b>6A50</b> Sup Struc: <input type="text"/> | <b>6A51</b> Sub Struc: <input type="text"/> |
|---------------------------------------------|---------------------------------------------|

**Fracture Critical**

| Main                                        | Approach             |
|---------------------------------------------|----------------------|
| <b>6A44</b> Group No: <input type="text"/>  | <input type="text"/> |
| <b>6A45</b> Mem Type: <input type="text"/>  | <input type="text"/> |
| <b>6A46</b> Fatig Sus: <input type="text"/> | <input type="text"/> |
| <b>6A47</b> Material: <input type="text"/>  | <input type="text"/> |
| <b>6A48</b> Adtt: <input type="text"/>      | <input type="text"/> |
| <b>6A49</b> Total CRF: <input type="text"/> | <input type="text"/> |

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**D-491 6B**  
Commonwealth of Pennsylvania  
Department of Transportation

**BRIDGE MANAGEMENT SYSTEM2**  
**AGENCY INSPECTION**

**7A01** Inspection Date:

CO

SR

**5A01**

SEG

OFF

**5A03**

BRKEY

**6B01** Spc Insp Type:

**6B02** New Wear Surf 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 Excpt:

**Struc Cond / Load Cap Appraisal**

**6B16** Appr Based On:

**6B17** ADT:

**6B18** Inventory Rating:

**6B19** Cap Appr Cntrl:

**Next Inspection**

**6B20** Insp Type:

**Inspection Team**

**6B21** Crane Insp Dt:

**7A02** Team Leader:

**7A04** Inspected By:

**6B23** Member:

**6B24** Hired By:

**6B25** Insp Cont Num:

**Inspection Hrs (Actual)**

**6B26** NBI Crew:

**6B27** Crane:

**Inspection Cost**

**6B32** Engineer:

**Paint Info**

**6B35** New Paint Since Last Insp:

**6B28** Frac Crit:

**6B29** Other 1:

**6B36** Paint:

**6B30** UWATER:

**6B31** Other 2:

**6B37** Paint (Extent):

**Condition Rating**

**6B38** Appr Slab:

**Sufficiency Rating**

**6B41** Fund Rehab Elig:

**6B39** Appr Roadway:

**6B42** S1:

**6B43** S2:

**6B44** S3:

**6B45** S4:

**6B40** Deck Wear Surf:

**4A13** Suff Rating:

**6B46** Deficiency Rating:

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**D-491 6C**  
Commonwealth of Pennsylvania  
Department of Transportation

**BRIDGE MANAGEMENT SYSTEM2**  
**AGENCY ROADWAY**

**7A01** Inspection Date:

**5A01**  **CO**  **SR**  **SEG**  **OFF**   
**5A03**  **BRKEY**

**Roadway Identification**

**5C03** On/Under:  **5C04** Kind Hwy:   
**5C01** Rd/Rte Name:  **5C06** Rte #/Suffix:    
**5A07** Feat Int:  **5A08** Facility Carried:

**State Roadway Location (R01)**

**6C01** County:   
**6C02** St Rte Num:   
**6C03** Seg:  **6C04** Offset:

**Roadway Admin**

**6C05** Adm Jur:  **6C07** Gov Con:   
**6C06** Fed Aid:   
**6C08** Urban/Rural:  **6C09** Hwy Ind:   
**6C10** Hwy Sys Typ:

**Network**

**6C11** St cd:  **6C12** INT:   
**6C13** CCVNET:  **6C14** ATTT:   
**6C15** NHS:  **6C16** TTTN:   
**5C22** Func Class:

**Clearance**

**4A20** Min Lat Und (L):  .000 ft **4A19** Min Lat Und (R):  .000 ft  
**6C18** Horiz (L):  .0 ft **6C19** Horiz (R):  .0 ft  
**6C20** Min Vert (L):  .0 ft **6C21** Min Vert (R):  .0 ft  
**6C22** Def Vert (L):  .0 ft **6C23** Def Vert (R):  .0 ft  
**6C24** Vert Clear Sign:

**Median**

**6C25** Type:  **6C26** Width:  ft  
**Traffic**  
**6C27** ADTT:  **6C28** ADTT Year:   
**5C10** Recent ADT:  **5C11** ADT Year(30):   
**5C14** Truck %ADT:  **6C29** Ovr Sz Byp Len:

**Roadway Labels**

**6C30** Gen Seg Ahead Lbl:  **6C31** User Seg Ahead Lbl:   
**6C32** Gen Seg Back Lbl:  **6C33** User Seg Back Lbl:

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**BRIDGE MANAGEMENT SYSTEM2**  
**INSPECTION SCHEDULE CARD**

**5A01**

CO  
[ ]

SR  
[ ]

SEG  
[ ]

OFF  
[ ]

**5A03**

BRKEY  
[ ]

**Summary**

**7A06 Inspections Performed**

**7A01** Inspection Date: [ ]

National Bridge Inventory:

**7A02** Team Leader: [ ]

Element:

**7A03** Primary Type: [ ]

Fracture Critical:

**7A04** Review Required:

Underwater:

**7A05** Inspected By: [ ]

Other Special:

**Schedule**

**7A07** Required (Y/N)

**7A08** Last Dt

**7A09** Freq

**7A10** Next Date

|                    |                          |         |         |
|--------------------|--------------------------|---------|---------|
| NBI:               | [ ]                      | [ ] mos | [ ]     |
| Fracture Critical: | <input type="checkbox"/> | [ ]     | [ ] mos |
| Underwater:        | <input type="checkbox"/> | [ ]     | [ ] mos |
| Other Special:     | <input type="checkbox"/> | [ ]     | [ ] mos |
| Element: NA        |                          | [ ] mos | [ ]     |

**Bridge Inspection Resources**

**7A11** Next Team Lead: [ ]

**7A12** NBI Crew Hr: [ ]

**7A13** Crane Hrs: [ ]

**7A14** Next Insp By: [ ]

**7A15** Frac Crit Hrs: [ ]

**7A16** Other 1 Hrs: [ ]

**7A17** UWATER Hrs: [ ]

**7A16** Other 2 Hrs: [ ]

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**D-491 AP**  
Commonwealth of Pennsylvania  
Department of Transportation

**BRIDGE MANAGEMENT SYSTEM2**  
**AGENCY PROJECT**

**5A01** **5A03**

CO SR SEG OFF BRKEY

|                   |                     |                |             |
|-------------------|---------------------|----------------|-------------|
| <b>Project ID</b> | <b>Project Name</b> | <b>Program</b> | <b>Year</b> |
|                   |                     |                |             |

|                                                                                                                                                    |                                                                                                                                                                                                                       |
|----------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Bridge Project</b><br><b>AP01</b> MPMS Project Num: <input type="text"/><br><b>AP02</b> Bridge Project Ind: <input checked="" type="checkbox"/> | <b>Bridge Bill Indicators</b><br><b>AP03</b> Design: <input checked="" type="checkbox"/> <b>AP04</b> Row/Utilities: <input checked="" type="checkbox"/> <b>AP05</b> Construction: <input checked="" type="checkbox"/> |
|----------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                                                                                                                                                |                                                                                                                                                                                                                  |                                                                                                                                                                                                                                   |
|------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Contract Management</b><br><b>AP06</b> Work Desig For: <input type="text"/><br><b>AP07</b> ECMS Number: <input checked="" type="checkbox"/> | <b>Maintenance Project Information</b><br><b>AP09</b> SAP WO Num: <input type="text"/><br><b>AP10</b> SAP WO Status: <input checked="" type="checkbox"/><br><b>AP11</b> WBS: <input checked="" type="checkbox"/> | <b>Twelve Year Program Indicators</b><br><b>AP12</b> Construction: <input checked="" type="checkbox"/><br><b>AP13</b> Design: <input checked="" type="checkbox"/><br><b>AP14</b> ROW/Utility: <input checked="" type="checkbox"/> |
|------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                         |                                                                                                                                                                                                     |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>AP08 Federal Aid Project Numbers</b><br><input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>                                                                                                                                                                                                                                                                          | <b>Project Activity Dates (Actual)</b><br><b>AP17</b> Contract Letting: <input checked="" type="checkbox"/><br><b>AP19</b> NTP: <input checked="" type="checkbox"/><br><b>AP21</b> Open to Traffic: <input checked="" type="checkbox"/> | <b>AP18</b> Contract Award: <input checked="" type="checkbox"/><br><b>AP20</b> Completion: <input checked="" type="checkbox"/><br><b>AP22</b> Final Acceptance: <input checked="" type="checkbox"/> |
| <b>AP15 State Project Number</b><br>System: <input checked="" type="checkbox"/> Route: <input checked="" type="checkbox"/><br>Subproject: <input checked="" type="checkbox"/> Phase: <input checked="" type="checkbox"/><br>Section: <input checked="" type="checkbox"/> Organization: <input checked="" type="checkbox"/><br>Program: <input checked="" type="checkbox"/> <b>AP16</b> WBS: <input checked="" type="checkbox"/> |                                                                                                                                                                                                                                         |                                                                                                                                                                                                     |

| <b>Project Phase</b>                                 | <b>Rough Estimate</b> | <b>Engineer Estimate</b> | <b>Estimated Cost</b> | <b>Approved Cost</b> |
|------------------------------------------------------|-----------------------|--------------------------|-----------------------|----------------------|
| <b>AP23</b> Study: <input type="text"/>              | <input type="text"/>  | <input type="text"/>     | <input type="text"/>  | <input type="text"/> |
| <b>AP24</b> Preliminary Design: <input type="text"/> | <input type="text"/>  | <input type="text"/>     | <input type="text"/>  | <input type="text"/> |
| <b>AP25</b> Right of Way: <input type="text"/>       | <input type="text"/>  | <input type="text"/>     | <input type="text"/>  | <input type="text"/> |
| <b>AP26</b> Utilities: <input type="text"/>          | <input type="text"/>  | <input type="text"/>     | <input type="text"/>  | <input type="text"/> |
| <b>AP27</b> Final Design: <input type="text"/>       | <input type="text"/>  | <input type="text"/>     | <input type="text"/>  | <input type="text"/> |
| <b>AP28</b> Construction: <input type="text"/>       | <input type="text"/>  | <input type="text"/>     | <input type="text"/>  | <input type="text"/> |
| <b>AP29</b> Other Costs: <input type="text"/>        | <input type="text"/>  | <input type="text"/>     | <input type="text"/>  | <input type="text"/> |
| <b>AP30</b> Total Costs: <input type="text"/>        | <input type="text"/>  | <input type="text"/>     | <input type="text"/>  | <input type="text"/> |

**AP31** Anticipated Environment Clearance Level:  **AP32** Row Needed:

**Anticipated MPT Needs:**

|                                                                                                                                                                                                                                                       |                                                                                              |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|
| <b>AP33</b> Crossover: <input type="checkbox"/> <b>AP34</b> Detour: <input type="checkbox"/> <b>AP35</b> Half Width: <input type="checkbox"/> <b>AP36</b> Lane Restriction: <input type="checkbox"/> <b>AP37</b> Night Only: <input type="checkbox"/> | <b>AP38</b> Temp Bridge: <input type="checkbox"/> <b>AP39</b> None: <input type="checkbox"/> |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|

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**D-491 VD**  
Commonwealth of Pennsylvania  
Department of Transportation

**BRIDGE MANAGEMENT SYSTEM2**  
**INVENTORY DESIGN**

**5A01**

CO      SR      SEG      OFF

**5A03**

BRKEY

**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:  PSI

**VD09** Comp Strength @ Release:  PSI

**VD10 Prestressed Splice Type**

Design:

**VD12** Void Types:

Filler:

Through:

**VD13** Strand Sizes:

**Substructure**

**VD14 Abutment Type**

Near:

**VD16** Pier Types:

Far:

**VD15 Abutment Foundation Type**

Near:

**VD17** Pier Foundation Types:

Far:

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**D-491 VN**  
Commonwealth of Pennsylvania  
Department of Transportation

**BRIDGE MANAGEMENT SYSTEM2**  
**INVENTORY DRAWING AND NOTES**

**5A01**

CO

SR

SEG

OFF

**5A03**

BRKEY

**VN01 Design Exception Codes:**

**VN02 Soil Boring Notes:**

**VN03 Test Description:**

**VN04 Storage Location:**

**VN05 Design Drawing Numbers and Descriptions:**

**VN06 Shop Drawing Numbers and Descriptions:**

**VN07 Repair Drawing Numbers and Descriptions:**

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**D-491 VP**  
Commonwealth of Pennsylvania  
Department of Transportation

**BRIDGE MANAGEMENT SYSTEM2**  
**INVENTORY POSTING**

**5A01**

**SR**

**SEG**

**OFF**

**5A03**

| <b>VP01</b><br>Status<br>Date | <b>VP02</b><br>Post<br>Status | <b>VP03</b><br>Spec Rest<br>Posting | <b>VP04</b><br>Post Wt.<br>Limit (tons) | <b>VP05</b><br>Post Limit<br>Comb (tons) | <b>VP06</b><br>Posting<br>Reason | <b>VP07</b><br>Field<br>Cond | <b>VP08</b><br>Spec<br>Cond | <b>VP09</b><br>AASHTO<br>Impact |
|-------------------------------|-------------------------------|-------------------------------------|-----------------------------------------|------------------------------------------|----------------------------------|------------------------------|-----------------------------|---------------------------------|
| <input type="text"/>          | <input type="checkbox"/>      | <input type="checkbox"/>            | <input type="text"/>                    | <input type="text"/>                     | <input type="checkbox"/>         | <input type="checkbox"/>     | <input type="checkbox"/>    | <input type="checkbox"/>        |

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**D-491 IR**  
Commonwealth of Pennsylvania  
Department of Transportation

**BRIDGE MANAGEMENT SYSTEM2**  
**INSPECTION LOAD RATING**

|                              |                      |                              |             |
|------------------------------|----------------------|------------------------------|-------------|
| <b>7A01</b> Inspection Date: | <input type="text"/> | <b>5A01</b>                  | <b>5A03</b> |
|                              |                      | CO      SR      SEG      OFF | BRKEY       |

**IR01a** Load Rating Review Rec:  **IR01b** Reviewer Action:  **IR02** Rating Approved:   
**IR03** Calc Date:

**IR04** Load Type:

**IR10** Inventory Rating:  ton

**IR05** NBI:

**IR11** Operating Rating:  ton

**IR06** Load Rating Meth:

**IR12** Govern Crit Inv:

**IR07** Cntrl Memb Type:

**IR13** Govern Crit Opr:

**IR08** Fatig Stress Cat:

**IR14** AASHTO Manl Yr:

**IR09** Fatig Load Type:

**IR15** AASHTO Spec Yr:

**IR16** Engineer:

**IR17** Rating Dataset:

**IR18** Stress Range:  ksi

**IR19** Notes:

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D-491 IF  
Commonwealth of Pennsylvania  
Department of Transportation

BRIDGE MANAGEMENT SYSTEM2  
INSPECTION FRACTURE CRITICAL

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                          |                          |     |     |                          |                          |                          |                          |       |                          |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|--------------------------|-----|-----|--------------------------|--------------------------|--------------------------|--------------------------|-------|--------------------------|
| <p><b>7A01</b> Inspection Date: <input type="text"/></p> <p><b>7A02</b> Primary Insp Type: <input type="text"/>    <b>7A08</b> Freq: <input type="text"/> months</p> <p><b>Main</b><br/><b>6A42</b> Group: <input type="checkbox"/> <b>6A43</b> CRF: <input type="text"/> <b>6A47</b> Total CRF: <input type="text"/> <b>6A26</b> Dept. Struc Type: <input type="text"/></p> <p><b>Approach</b><br/><b>Group:</b> <input type="checkbox"/>    <b>CRF:</b> <input type="text"/>    <b>Total CRF:</b> <input type="text"/> <b>6A26 Dept. Struc Type:</b> <input type="text"/></p> <p><b>Fracture Critical Details</b></p> <p><b>IF01</b> FC Location: <input type="text"/>    <b>IF02</b> FC Member Type: <input type="text"/><br/><b>IF03</b> FC Member: <input type="text"/><br/><b>IF04</b> Member Detail: <input type="text"/><br/><b>IF05</b> Fatigue Stress Cat: <input type="text"/><br/><b>IF06</b> Mem Detail Cond: <input type="text"/></p> | <p><b>5A01</b></p> <table border="1" style="margin-left: auto; margin-right: auto;"><tr><td>CO</td><td>SR</td><td>SEG</td><td>OFF</td></tr><tr><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td><input type="checkbox"/></td></tr></table> <p><b>5A03</b></p> <table border="1" style="margin-left: auto; margin-right: auto;"><tr><td>BRKEY</td></tr><tr><td><input type="checkbox"/></td></tr></table> | CO                       | SR                       | SEG | OFF | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | BRKEY | <input type="checkbox"/> |
| CO                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | SR                                                                                                                                                                                                                                                                                                                                                                                                                                                             | SEG                      | OFF                      |     |     |                          |                          |                          |                          |       |                          |
| <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                       | <input type="checkbox"/> | <input type="checkbox"/> |     |     |                          |                          |                          |                          |       |                          |
| BRKEY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                          |                          |     |     |                          |                          |                          |                          |       |                          |
| <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                          |                          |     |     |                          |                          |                          |                          |       |                          |

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**D-491 IU**  
Commonwealth of Pennsylvania  
Department of Transportation

**BRIDGE MANAGEMENT SYSTEM2**  
**INSPECTION UNDERWATER / OSA**

**5A01**  
CO      SR      SEG      OFF      **5A03**  
[ ]      [ ]      [ ]      [ ]      [ ]      BRKEY

**7A03** Prim Insp Type: [ ]  
**7A09** Insp Freq: [ ] Months

**IU01** Recalc SCBI:  **IU02** Num Units: [ ]  
**IU03** SCBI Source: [ ] **4A08** SCBI: [ ]

**OSA**

**IU04** Total Osa: [ ]

**IU06** Stream Bed Material: [ ] [ ]

**IU05** Total Sar: [ ]

**IU07** Stream Bed Material Desc: [ ]

**SAR Calculation Data**

**IU08** Debris Poth: [ ]

**IU09** Trapping Poth: [ ]

**IU10** Pressure Flow: [ ]

**IU11** NAB Loc: [ ]

**IU12** FAB Loc: [ ]

**IU13** US Lft WW Pres: [ ]

**IU14** Condition: [ ]

**IU15** US Rt WW Pres: [ ]

**IU16** Condition: [ ]

**IU17** Horz Debris Start: [ ]

**IU18** Horz Debris End: [ ] (0% = LAB to 100% = RAB)

**IU19** Vert Debris Start: [ ]

**IU20** Vert Debris End: [ ] (0% = Streambed to 100% = Beam)

**Current Countermeasures**

| <b>IU21</b><br>Type | <b>IU22</b><br>Location | <b>IU23</b><br>Cond | <b>IU24</b><br>Sub Unit |
|---------------------|-------------------------|---------------------|-------------------------|
| [ ]                 | [ ]                     | [ ]                 | [ ]                     |

**Potential Countermeasures**

| <b>IU25</b><br>Location | <b>IU26</b><br>Work Cand |
|-------------------------|--------------------------|
| [ ]                     | [ ]                      |

**Sub Unit OSA Data**

**IN01** Sub Unit: [ ]

**IN12** Pier/Abut Type: [ ] **IN14** Found Type: [ ] **IN05** Scour Hole: [ ]

**IN19** Move Ind:  **IN04** Change Since Last Insp: [ ] **IN15** Stream Bed Material: [ ]

**IN03** Scour Rating: [ ] **IU27** OSA Code:  **IU28** OSA Case:  **IU29** Sar: [ ]

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D-491 IN

Commonwealth of Pennsylvania  
Department of Transportation

BRIDGE MANAGEMENT SYSTEM2  
INSPECTION UNDERWATER / SUB UNITS

| 7A01                         |                          | 5A01                         |                          |                       |                          | 5A03 |  |
|------------------------------|--------------------------|------------------------------|--------------------------|-----------------------|--------------------------|------|--|
| CO                           | SR                       | SEG                          | OFF                      | BRKEY                 |                          |      |  |
| 7A01 Inspection Date:        | [ ]                      | [ ]                          | [ ]                      | [ ]                   | [ ]                      |      |  |
| 7A03 Prim Insp Type:         | [ ]                      | IU01 Recalc SCBI:            | <input type="checkbox"/> | IU02 Num Units:       | [ ]                      |      |  |
| 7A09 Insp Freq:              | [ ] Months               | IU03 SCBI Source:            | [ ]                      | 4A08 SCBI:            | [ ]                      |      |  |
| IN01 Sub Unit:               | [ ]                      | IN02 Curr Ind:               | <input type="checkbox"/> | IN03 Scour Rating:    | [ ]                      |      |  |
| IN04 Chg Since Last Insp:    | [ ]                      | IN05 Scour Hole:             | [ ]                      | IN06 Debris Potn:     | [ ]                      |      |  |
| IN07 Scourability:           | [ ]                      | IN08 Op Ad Chann:            | [ ]                      | IN09 Sediment:        | [ ]                      |      |  |
| IN10 Alignment:              | [ ]                      | IN11 Velocity Stream Slope:  | [ ]                      | IN13 Inv Found Type:  | [ ]                      |      |  |
| IN12 Pier/Abut Type:         | [ ]                      | IN14 Found Type:             | [ ]                      | IN15 Streambed Matt:  | [ ]                      |      |  |
| IN16 UW Insp Type:           | [ ]                      | IN17 Ob Scour Depth:         | [ ] ft                   | IN18 Water Depth:     | [ ] ft                   |      |  |
| IN19 Movement Ind:           | <input type="checkbox"/> | IN20 Scour/Undermine Ind:    | <input type="checkbox"/> | IN21 Countermeasures: | <input type="checkbox"/> |      |  |
| IN22 100 yr Flood Sc. Depth: | [ ] ft                   | IN23 500 yr Flood Sc. Depth: | [ ] ft                   |                       |                          |      |  |
| IN24 Notes:                  | [ ]                      |                              |                          |                       |                          |      |  |

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**D-491 IL**  
Commonwealth of Pennsylvania  
Department of Transportation

**BRIDGE MANAGEMENT SYSTEM2**  
**INSPECTION UNDERWATER / OTHER**

**5A01**

CO

SR

SEG

OFF

**5A03**

BRKEY

**7A03** Prim Insp Type:   
**7A09** Insp Freq:  Months

**IU01** Recalc SCBI:  **IU02** Num Units:   
**IU03** SCBI Source:  **4A08** SCBI:

**Structure Level Data**

**1A08** Water Adequacy:  **IL01** Notes:   
**IL02** Risk of Overtopping:  **IL03** Traffic Delay:  **IL04** Func Class:

**High Water Mark**

**IL05** Elevation:  **IL06** Date:  **IL07** New High Water:   
**IL08** High Water Notes:

**Underclearance**

| <b>IL09</b><br>Origin Desc. | <b>IL10</b><br>Horz.<br>(ft) | <b>IL11</b><br>Vert.<br>(ft) | <b>IL12</b><br>Notes |
|-----------------------------|------------------------------|------------------------------|----------------------|
| <input type="text"/>        | <input type="text"/>         | <input type="text"/>         | <input type="text"/> |

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**D-491 FR**  
Commonwealth of Pennsylvania  
Department of Transportation

**BRIDGE MANAGEMENT SYSTEM2**  
**FEATURE INTERSECTED - RAILROAD**

|             |           |           |            |            |              |
|-------------|-----------|-----------|------------|------------|--------------|
| <b>5A01</b> | <b>CO</b> | <b>SR</b> | <b>SEG</b> | <b>OFF</b> | <b>BRKEY</b> |
|             |           |           |            |            |              |

**Railroad Detail**

|                                                       |                                                             |
|-------------------------------------------------------|-------------------------------------------------------------|
| <b>FR01</b> RR Name: <input type="text"/>             | <b>FR02</b> On/Under: <input type="text"/>                  |
| <b>FR03</b> Service Status: <input type="text"/>      | <b>FR04</b> RR Milepost: <input type="text"/>               |
| <b>FR05</b> AAR DOT Num: <input type="text"/>         | <b>FR06</b> Num of Electrified Tracks: <input type="text"/> |
| <b>FR07</b> Total Num Tracks: <input type="text"/>    |                                                             |
| <b>FR08</b> Span Desc: <input type="text"/>           |                                                             |
| <b>FR09</b> Additional Operator: <input type="text"/> |                                                             |

**Clearance**

|                                                           |                                                            |
|-----------------------------------------------------------|------------------------------------------------------------|
| <b>4A20</b> Min Lat Under (Left): <input type="text"/> ft | <b>4A19</b> Min Lat Under (Right): <input type="text"/> ft |
| <b>FR10</b> Min Over Vert (Left): <input type="text"/> ft | <b>FR11</b> Min Over Vert (Right): <input type="text"/> ft |
| <b>FR12</b> Horiz (Left): <input type="text"/> ft         | <b>FR13</b> Horiz (Right): <input type="text"/> ft         |
| <b>FR14</b> DefVert (Left): <input type="text"/> ft       | <b>FR15</b> DefVert (Right): <input type="text"/> ft       |

**FR16** Notes:

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**D-491 FT**  
Commonwealth of Pennsylvania  
Department of Transportation

**BRIDGE MANAGEMENT SYSTEM2**  
**FEATURE INTERSECTED - UTILITY**

**5A01**  
CO      SR      SEG      OFF      BRKEY

**FT01**  
Utility Name      **FT02**  
Utility Type      **FT03**  
License Num  
[ ] [ ] [ ]

**Utility Detail**

**FT01** Utility Name: [ ]

**FT02** Utility Type: [ ]

**FT03** License Num: [ ]

**FT04** License Num Issue Dt: [ ]

**FT05** Utility Weight: [ ] kips

**FT06** Utility Addr: [ ]

**FT07** Hazmat:

**FT08** Location: [ ]

**FT09** ContactInfo: [ ]

**FT10** Notes: [ ]

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D-491 FW  
Commonwealth of Pennsylvania  
Department of Transportation

BRIDGE MANAGEMENT SYSTEM2  
FEATURE INTERSECTED - WATERWAY

|    |    |     |     |               |
|----|----|-----|-----|---------------|
| CO | SR | SEG | OFF | 5A03<br>BRKEY |
|----|----|-----|-----|---------------|

4A21 Nav Control Exists:  4A23 Nav Horizontal Clr:  ft  
4A22 Nav Vertical Clr:  ft 4A24 Min Vert Lft Clr:  ft

|                     |                  |                                |                             |
|---------------------|------------------|--------------------------------|-----------------------------|
| FW01<br>Stream Name | 5C03<br>On Under | FW09<br>Waterflow<br>Direction | FW10<br>Primary<br>Waterway |
|---------------------|------------------|--------------------------------|-----------------------------|

Waterway Detail

|                                                    |                                                    |                                          |
|----------------------------------------------------|----------------------------------------------------|------------------------------------------|
| FW01 Stream Name: <input type="text"/>             | FW02 Stream Classification 1: <input type="text"/> |                                          |
| FW03 Stream Classification 2: <input type="text"/> | FW04 Timeframe: <input type="text"/>               |                                          |
| FW05 Stream Classification 3: <input type="text"/> | FW06 Permit Type: <input type="text"/>             |                                          |
| FW07 Drainage Area: <input type="text"/> sq. mi.   | FW08 Fishable: <input type="checkbox"/>            | FW09 Waterflow Dir: <input type="text"/> |
| FW11 Vertical Clearance: <input type="text"/> ft   | Design Flood Data                                  |                                          |
| FW12 Max W.S. Elevation: <input type="text"/> ft   | FW14 Magnitude: <input type="text"/> cfs           | FW15 Elevation: <input type="text"/> ft  |
| FW13 Max W.S. Elev Year: <input type="text"/>      | FW16 Frequency: <input type="text"/>               | FW17 Velocity: <input type="text"/> fps  |
| FW18 Pollutant Desc: <input type="text"/>          |                                                    |                                          |

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