Introduction to the SNBI

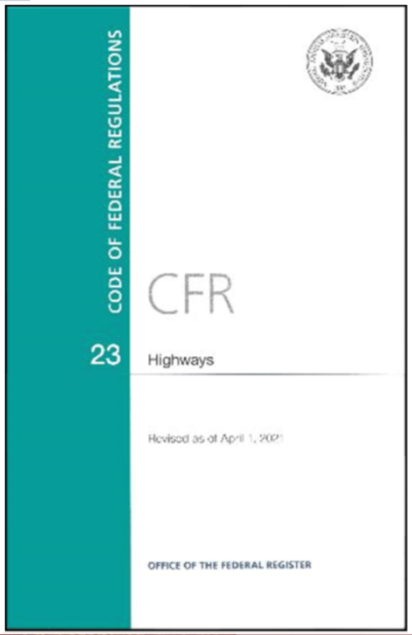
U.S. Department of Transportation
Federal Highway Administration

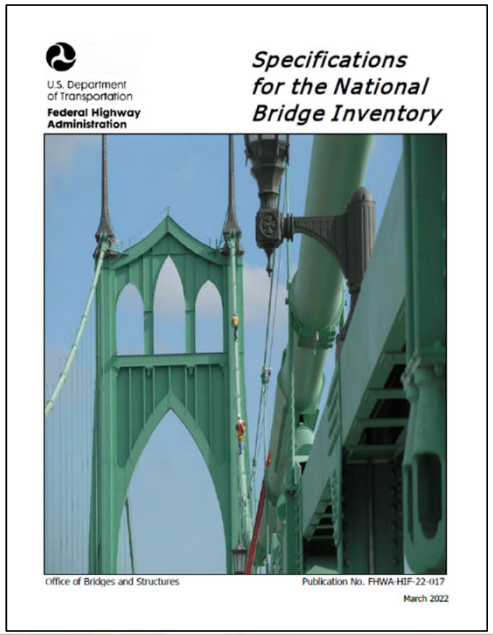
Michigan Bridge Week 2023

March 15, 2023 – Muskegon, MI

U.S. Department of Transportation
Federal Highway Administration

NBIS / SNBI Introduction





Lesson Intro.1

NBIS – § 650.301 Purpose

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- Sets the national minimum standards for the proper safety inspection and evaluation of all highway bridges in accordance with 23 U.S.C. 144(h) and the requirements for preparing and maintaining an inventory in accordance with 23 U.S.C. 144(b)

NBIS – § 650.303 Applicability

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- Apply to all structures defined as highway bridges located on all public roads, on and off Federal-aid highways
- Includes
  - tribally-owned and federally-owned bridges
  - private bridges that are connected to a public road on both ends of the bridge
  - temporary bridges
  - bridges under construction with portions open to traffic

NBIS – § 650.305 Definitions

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- The term ‘‘highway’’ is defined in 23 U.S.C. 101
- 23 U.S.C. 101 – The term highway includes
  - A road, street, and parkway
  - A right-of-way, bridge, railroad-highway crossing, tunnel, drainage structure, sign, guardrail, and protective structure, in connection with a highway
  - A portion of any interstate or international bridge or tunnel and the approaches thereto, the cost of which is assumed by a State transportation department, including such facilities as may be required by the United States Customs and Immigration Services in connection with the operation of an international bridge or tunnel

NBIS – § 650.305 Definitions

U.S. Department of Transportation
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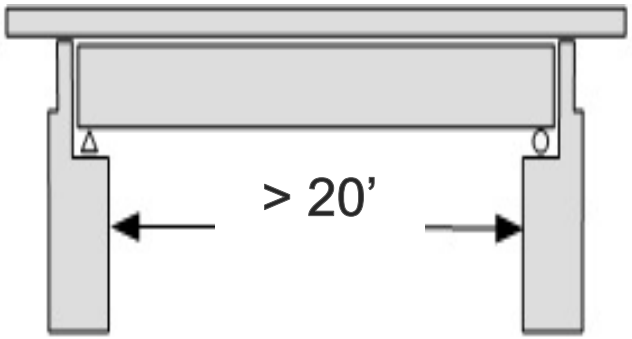
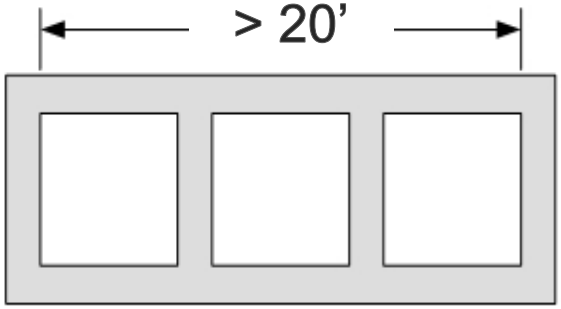
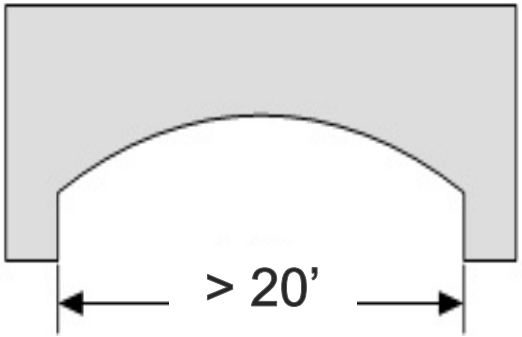
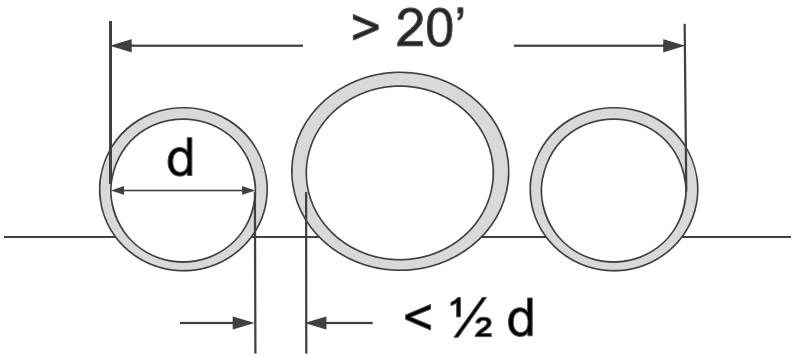
- Bridge…
  - A structure including supports erected over a depression or an obstruction
    - Such as water, highway, or railway
  - Having a track or passageway for carrying traffic or other moving loads
  - Having an opening measured along the center of the roadway of more than 20 feet between
    - Under copings of abutments or spring lines of arches
    - Extreme ends of openings for multiple boxes
    - Includes multiple pipes, where the clear distance between openings is less than half of the smaller contiguous opening

NBIS Bridges









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NBIS – § 650.305 Definitions

U.S. Department of Transportation
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- Public road - The term ‘‘public road’’ is defined in 23 U.S.C. 101
  - Public road – any road or street under the jurisdiction of and maintained by a public authority and open to public travel. (23 U.S.C. 101)
  - Public authority – a Federal, State, county, town, or township, Indian tribe, municipal or other local government or instrumentality with authority to finance, build, operate, or maintain toll or toll- free facilities (23 U.S.C. 101)
- Federal-aid highway – a public highway eligible for assistance under this chapter other than a highway functionally classified as a local road or rural minor collector (23 U.S.C. 101)

NBIS – § 650.305 Definitions

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- Private bridge – A bridge open to public travel and not owned by a public authority as defined in 23 U.S.C. 101
- Temporary bridge – A bridge which is constructed to carry highway traffic until the permanent facility is built, repaired, rehabilitated, or replaced

NBIS – § 650.307 Bridge Inspection Organization Responsibilities

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- Each State transportation department, Federal agency, or Tribal government (NBIS Agency) must include a bridge inspection organization that is responsible for…
  - Preparing, maintaining, and reporting bridge inventory data

NBIS – § 650.307 Bridge Inspection Organization Responsibilities

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- Function may be delegated to other individuals, agencies, or entities
  - Delegated roles and functions of all individuals, agencies, and entities involved must be documented by the responsible NBIS Agency
  - Delegation does not relieve the NBIS Agency of any of its responsibilities
  - Exception - A Tribal government may, with Bureau of Indian Affairs' (BIA) or FHWA's concurrence via a formal written agreement, delegate its functions and responsibilities to the BIA or FHWA

NBIS – § 650.315 Inventory

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- Each NBIS Agency must prepare and maintain an inventory of all bridges subject to this subpart
- Inventory data, as defined in § 650.305, must be collected, updated, and retained by the NBIS Agency and submitted to FHWA on an annual basis or whenever requested
  - Inventory data - All data reported to the National Bridge Inventory (NBI) in accordance with § 650.315
- Specifications for collecting and reporting this data are contained in the SNBI

NBIS – § 650.317 Incorporation by Reference

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- AASHTO
  - Manual for Bridge Evaluation (MBE), Third Edition, 2018
  - MBE, 2019 Interim Revisions [to 2018 Third Edition]
  - MBE, 2020 Interim Revisions [to 2018 Third Edition]
  - Manual for Bridge Element Inspection (MBEI), Second Edition, 2019
- FHWA
  - FHWA–HIF–22–017: SNBI, March 2022

NBI Data

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- Serves the following practical purposes for FHWA
  - Ensuring highway bridge safety
  - Enabling oversight of the National Bridge Inspection Program (NBIP)
  - Reporting to Congress
  - Emergency response
  - Administering a risk-based, data driven, performance management program in accordance with Title 23 U.S.C. §150 and the National Performance Management Measures for Assessing Bridge Condition regulation (23 CFR 490, Subpart D)
  - Providing quality data through clarity and ease of use

SNBI Development

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- Developed in coordination with the…
  - National Bridge Inspection Standards (NBIS) - 23 CFR 650, Subpart C
    - SNBI Incorporated by reference in § 650.317
  - AASHTO Manual for Bridge Evaluation (MBE)
  - AASHTO Manual for Bridge Element Inspection (MBEI)
  - FHWA Bridge Inspector's Reference Manual (BIRM)
- Provides the specifications for reporting data for highway bridges, open to the public, to FHWA for inclusion in the NBI

AASHTO MBE and FHWA BIRM

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- AASHTO MBE discusses the various items of information that are to be recorded as part of bridge inspections
- AASHTO MBE and FHWA's BIRM discuss inspection procedures and the preparation of detailed reports about bridge members
  - These documents are the basis for reporting values for many of the data items shown in the SNBI

Condition Evaluation Data

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- Proper assessment of bridge conditions and the ability to use condition data to efficiently and effectively manage bridge inventories are cornerstones to providing a safe and efficient highway transportation system
- The SNBI include descriptions of bridge condition rating data for…
  - Component-level (e.g., deck, superstructure, substructure, culvert…)
  - Element-level
    - Required for NHS bridges
    - Accepted for Non-NHS bridges if reported to FHWA

SNBI Data Reporting

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- For all highway bridges subject to the NBIS and their related features
- Based on the definitions, explanations, and data items supplied in the SNBI
  - Supplemented by the NBIS, AASHTO MBEI, AASHTO MBE, and FHWA BIRM

SNBI Data Reporting (cont.)

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- NBIS Agencies use the data items and instructions when reporting NBI data to FHWA
  - NBIS Agencies are responsible for the accuracy and completeness of the reported data, using agency data quality control and quality assurance procedures
  - NBIS Agencies may use their own data item names and codes for their agency inventory, but must report NBI data to FHWA in accordance with the SNBI

SNBI Data Items

- Information is maintained in the NBI database
- Enables state-level and national-level analyses and reporting
- Supports Federal funding programs
- Facilitates the identification of freight and defense-critical corridors and connectors

SNBI Data Items (cont.)

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- Complete and thorough inventory allows for an accurate report to Congress on the number, condition, and performance of the Nation's bridges
- Supports FHWA's programs
- Supports efforts of the Military Surface Deployment and Distribution Command (SDDC) Transportation Engineering Agency (TEA)

SNBI – Not Just for Inspectors

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- Expect coordination between various NBIS Agency personnel, in various infrastructure disciplines, to obtain and report the data
  - Traffic – Traffic/Operations
  - Roadside hardware – Safety/Traffic/Operations/Design
  - Scour – Hydraulics and Hydrology/Geotechnical/Structures
  - Load Rating and Posting – Load Rating Engineer
  - Railroads
  - Work performed – Maintenance/Construction
  - Geometry – Designers
- Do not expect to solely rely on bridge inspectors for all data

SNBI – May Not Be All Inclusive

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- All possible combinations of actual bridge characteristics may not be addressed in the SNBI
- Consult your local FHWA division office contact

Data Item Grouping

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- Data items grouped into sections and subsections with like characteristics
- Sections
  - Section 1: Bridge Identification
  - Section 2: Bridge Material and Type
  - Section 3: Bridge Geometry
  - Section 4: Features
  - Section 5: Loads, Load Rating, and Posting
  - Section 6: Inspections
  - Section 7: Bridge Condition

Section 1: Bridge Identification

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- Subsection 1.1: Identification
- Subsection 1.2: Location
- Subsection 1.3: Classification

Details on the data items within these subsections are addressed in Module 1

Section 2: Bridge Material and Type

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- Subsection 2.1: Span Material and Type
- Subsection 2.2: Substructure Material and Type
- Subsection 2.3: Roadside Hardware

Details on the data items within these subsections are addressed in Module 2

Section 3: Bridge Geometry

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- No subsections

Details on the data items within this section are addressed in Module 3

Section 4: Features

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- Subsection 4.1: Feature Identification
- Subsection 4.2: Routes
- Subsection 4.3: Highways
- Subsection 4.4: Railroads
- Subsection 4.5: Navigable Waterways

Details on the data items within these subsections are addressed in Module 4

Section 5: Loads, Load Rating, and Posting

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- Subsection 5.1: Loads and Load Rating
- Subsection 5.2: Load Posting Status
- Subsection 5.3: Load Evaluation and Posting

Details on the data items within these subsections are addressed in Module 5

Section 6: Inspections

- Subsection 6.1: Inspection Requirements
- Subsection 6.2: Inspection Events

Details on the data items within these subsections are addressed in Module 6

Section 7: Bridge Condition

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- Subsection 7.1: Component Condition Ratings
- Subsection 7.2: Element Identification
- Subsection 7.3: Element Conditions
- Subsection 7.4: Appraisal
- Subsection 7.5: Work Events

Details on the data items within subsections 7.1 – 7.5 are addressed in Module 7

Data Item Values – Single

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- In most subsections, each data item has a single value associated with the reported bridge record
- Even if the value of a data item changes multiple times over a reporting period, only the value that applies at the time of submittal is reported
- Abbreviated list of example items
  - B.C.01 (Deck Condition Rating)
  - B.C.02 (Superstructure Condition Rating)
  - B.C.03 (Substructure Condition Rating)
  - B.CS.01 (Element Quantity Condition State One)
  - B.CS.02 (Element Quantity Condition State Two)

Data Item Values – Multiple Values

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- In some cases, multiple values may apply, but are still reported in a single instance
- Multiple values are delimited by the pipe character (|)
  - No additional spaces should be used in conjunction with the pipe character
- Items that allow for multiple values with pipe character
  - B.ID.02 (Bridge Name)
  - B.L.12 (Metropolitan Planning Organization)
  - B.CL.03 (Federal or Tribal Land Access)
  - B.F.03 (Feature Name)
  - B.IE.12 (Inspection Equipment)
  - B.W.03 (Work Performed)

SNBI – Anticipated Implementation Timeline

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Target Date	Action
2022 May 6	NBIS Final Rule published with SNBI incorporated by reference
2022 Jul	FHWA publishes Data Crosswalk
2022 Oct	FHWA publishes Data Submittal Schema and Data Submittal Validation Logic (initial version)
2023 Apr	FHWA makes Transition Tool available online
2024 Oct	FHWA makes NBI NextGen available online for data validation only
2025 Mar 15	Last submittal in 1995 Coding Guide format
2026 Jan 1	• **Last date to begin** verification of transitioned data and collection of new SNBI data for inspected bridges – Agencies may elect to begin data collection and verification earlier to meet the March 15, 2028 deadline for submittal of a complete SNBI dataset • FHWA makes NBI NextGen available for Data Submittals

SNBI – Anticipated Implementation Timeline

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Federal Highway Administration

Target Date	Action
2026 Mar 15	First SNBI submittal – Transitioned/Hybrid Dataset – At a minimum, all bridges submitted with transitioned data except for specified fields required to manage FHWA programs, which shall have collected or verified SNBI data – Continue verification of transitioned data and collection of new SNBI data
2026 Jun	Sunset Transition Tool
2027 Mar 15	Second SNBI submittal – Transitioned/Hybrid Dataset – Continue verification of transitioned data and collection of new SNBI data
2028 Mar 15	Third SNBI submittal – 100% populated/verified – No temporary codes permitted – First complete SNBI dataset with collected and verified SNBI data for all bridges

SNBI – Implementation Resources

- FHWA Bridge Inspection websites
  - https://www.fhwa.dot.gov/bridge/inspection/
  - https://www.fhwa.dot.gov/bridge/snbi.cfm
    - SNBI.PDF
    - Memo – Implementation of the SNBI (PDF)
    - Data Crosswalk for “Over” Records and “Under” Records (HTML and XLSX)
    - Detailed Code Mapping for Individual Data Items (HTML and XLSX)
    - Questions and Answers
    - Data Submittal Schema/Format
    - Data Submittal Validation Logic
    - Transition Tool
    - NBI NextGen (NBTIS – National Bridge and Tunnel Inventory System)


SNBI 2022 03


MEMO - SNBI Implementation

https://www.fhwa.dot.gov/bridge/inspection/

https://www.fhwa.dot.gov/bridge/nbi.cfm

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Bridges & Structures

Structures | Geotech | Hydraulics | Safety Inspection | **Management/Preservation**

Bridge Management | Bridge Preservation | Funding Programs | **National Bridge Inventory** | National Tunnel Inventory

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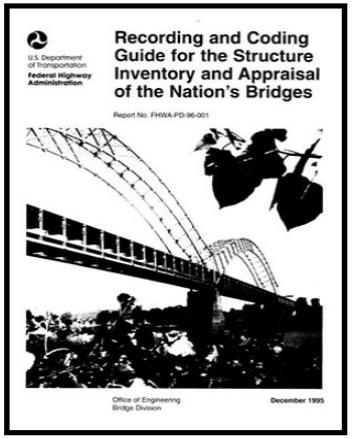
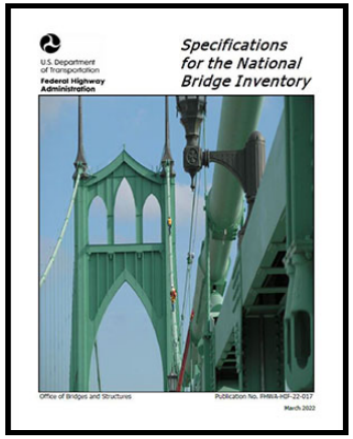
National Bridge Inventory (NBI)

NBI data and reporting is transitioning to a new data standard, guidance, procedures, and web application. Data will continue to be reported to FHWA using the Recording and Coding Guide for the Structure Inventory and Appraisal of the Nation's Bridges, guidance, procedures, and web application until the annual submittal date specified in FHWA's Implementation Memo. Subsequent submittals will be reported using the Specifications for the National Bridge Inventory (SNBI), guidance, procedures, and web application. Agencies will need to act now to satisfy the requirements of FHWA's Implementation Memo.

National Bridge Inventory – Based on the Coding Guide



National Bridge Inventory – Based on the SNBI



Contacts

- **Wendy McAbee**
  Office of Bridges and Structures
  202-366-5658
  E-mail Wendy
- **Semme Yilma**
  Office of Bridges and Structures
  202-366-6712
  E-mail Semme

Updated: 04/06/2022

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https://www.fhwa.dot.gov/bridge/snbi.cfm

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Bridges & Structures

Structures | Geotech | Hydraulics | Safety Inspection | **Management/Preservation**

Bridge Management | Bridge Preservation | Funding Programs | **National Bridge Inventory** | National Tunnel Inventory

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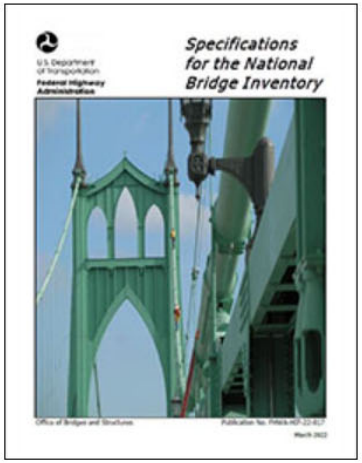
National Bridge Inventory (NBI) – Based on the SNBI

- Specifications for the National Bridge Inventory (SNBI) (.pdf)
- Memorandum - Implementation of the Specifications for the National Bridge Inventory (.pdf)
- Questions and Answers *(February 7, 2023)* NEW!
- Data Crosswalk - logic for transitioning data from Coding Guide to SNBI
  - Data Crosswalk for "Over" Records and "Under" Records, HTML | XLSX (60 kb)
  - Detailed Code Mapping for Individual Data Items, HTML | XLSX (161 kb)
- Data Submittal Schema/Format
- Data Submittal Validation Logic *(initial version coming in February 2023)*
- Transition Tool - web-based application for transitioning data from Coding Guide to SNBI *(coming in April 2023)*
- Data Submittal Validation Tool *(coming in October 2024)*
- NBI NextGen System *(coming in 2025)*



Contacts

- **Wendy McAbee**
  Office of Bridges and Structures
  202-366-5658
  E-mail Wendy
- **Semme Yilma**
  Office of Bridges and Structures
  202-366-6712
  E-mail Semme

Updated: 02/09/2023

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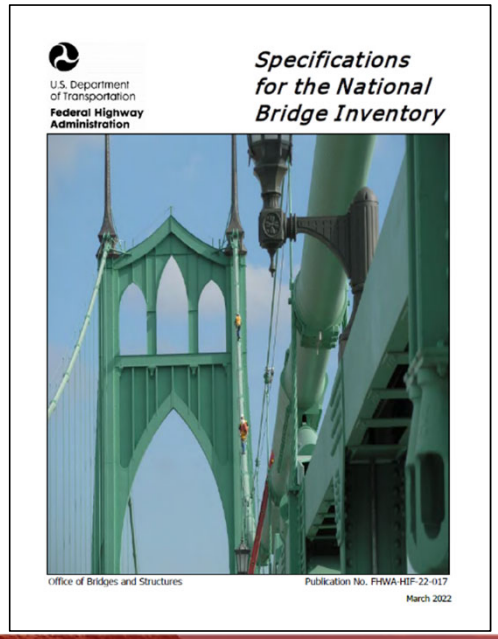
SNBI New Items



Lesson X.3

New Items – Not related to Coding Guide

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- There are 54 new items if you exclude element data items
  - Element data items for NHS bridges have been reported to FHWA since April 2015, therefore not new items
- Data item frequency
  - 36/54 new items: I (Initial) – Data recorded initially and updated when necessary
    - Would not typically change from inspection to inspection
    - Data recorded or updated by the inspector or other agency personnel
  - 14/54 new items: EI (Each Inspection) – Data verified and/or updated by the inspector during each inspection
  - 4/54 new items: C (Calculated) – Data calculated and stored by FHWA and not recorded during inspections or reported to FHWA

New Items

- Bridge Name
- Previous Bridge Number
- Border Bridge Designated Lead State
- Metropolitan Planning Organization
- Emergency Evacuation Designation
- Number of Beam Lines
- Span Protective System
- Deck Interaction
- Deck Stay-in-Place Forms
- Substructure Configuration Designation
- Number of Substructure Units
- Substructure Material
- Substructure Type
- Substructure Protective System
- Foundation Type
- Foundation Protective System
- Route Designation
- Crossing Bridge Number

New Items (cont.)

- Railroad Service Type
- Navigation Channel Minimum Horizontal Clearance
- Design Method
- Load Rating Date
- Routine Permit Loads
- Posting Status Change Date
- Legal Load Configuration
- Posting Type
- Posting Value

- Fatigue Details
- Complex Feature
- Inspection Completion Date*
- Nationally Certified Bridge Inspector*
- Inspection Due Date+
- Risk-Based Inspection Interval Method*
- Inspection Quality Control Date*
- Inspection Quality Assurance Date*
- Inspection Data Update Date*

*Frequency EI
+Calculated by FHWA

New Items (cont.)

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- Inspection Note*
- Inspection Equipment*
- Bridge Railings Condition Rating*
- Bridge Railing Transitions Condition Rating*
- Bridge Bearings Condition Rating*
- Bridge Joints Condition Rating*
- Bridge Condition Classification+
- Lowest Condition Rating Code+
- NSTM Inspection Condition*
- Underwater Inspection Condition*
- Scour Plan of Action
- Seismic Vulnerability
- Minimum Span Length
- Curved Bridge
- Maximum Bridge Height
- Sidehill Bridge
- Irregular Deck Area
- Calculated Deck Area+

*Frequency EI
+Calculated by FHWA

1.1 - Identification

- B.ID.01 Bridge Number
- ***B.ID.02 Bridge Name***
- ***B.ID.03 Previous Bridge Number***

B.ID.02 Bridge Name

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- Format AN(300), Frequency I
- Report the commonly known name(s) for the bridge
- For more than one name, report all names with the most common name first
- Report multiple names separated by pipe (|) delimiters
  - Harlem Bridge|State Route 43 Bridge
- If no commonly known name
  - Optional to report this item
  - Preferable to enter a general description

B.ID.03 Previous Bridge Number

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- Format AN(15), Frequency I
- The purpose of this item is to retain a link to data for previous bridge numbers associated with a current bridge in the NBI
- Report the bridge number previously associated with the bridge that has been replaced by the inventoried bridge, or when the inventoried bridge number has changed
- Report 0 if no previous bridge number
- For border bridges, the Neighboring State reports this item as part of their abbreviated bridge record

B.ID.03 Previous Bridge Number

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- Example 1
  - Bridge Number 024657 is constructed adjacent to Bridge Number 000123 as a planned replacement project
  - When the roadway is connected to the new bridge and it is opened, Bridge Number 000123 is closed and demolished
  - Report 000123
- Example 2
  - Separate parallel bridges with unique bridge numbers (Bridge Number 234 and Bridge Number 567) are reconstructed to form one bridge
  - The reconstructed bridge is inventoried as Bridge Number 234
  - Report 567

1.2 - Location

- B.L.01 State Code
- B.L.02 County Code
- B.L.03 Place Code
- B.L.04 Highway Agency District
- B.L.05 Latitude
- B.L.06 Longitude
- B.L.07 Border Bridge Number
- B.L.08 Border Bridge State or Country Code
- B.L.09 Border Bridge Inspection Responsibility
- ***B.L.10 Border Bridge Designated Lead State***
- B.L.11 Bridge Location
- ***B.L.12 Metropolitan Planning Organization***

B.L.10 Border Bridge Designated Lead State

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- Format N (2,0), Frequency I
- Report the State code for the State that has been determined to be the Designated Lead State for reporting the border bridge full record using one of the State codes listed in Item B.L.01 (State Code)
- Do not report this item when the bridge does not cross a border with another State or Country
- The Neighboring State reports this item as part of their abbreviated bridge record

B.L.10 Border Bridge Designated Lead State

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- Example
  - Border bridge between California and Arizona with shared inspection responsibility
  - Through agreement, California is determined to be the Designated Lead State
  - California and Arizona report 6 (i.e., State Code for California)
- Example
  - Border bridge between Illinois and Missouri with shared maintenance responsibility
  - Missouri has responsibility for inspection
  - Through agreement, Missouri is determined to be the Designated Lead State
  - Illinois and Missouri report 29 (i.e., State Code for Missouri)

B.L.12 Metropolitan Planning Organization

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- Format AN (300), Frequency I
- Report the name(s) of the MPO(s) in which the bridge is located, regardless of bridge owner or maintenance responsibility
- Report each MPO when the bridge is located on a boundary between MPOs
- Report multiple MPOs separated by pipe (|) delimiters
- Report N if bridge is not located in an MPO
- Only needs reported if a highway carried by the bridge is on the National Highway System, as indicated in Item B.H.03 (NHS Designation)

B.L.12 Metropolitan Planning Organization

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- Example
  - Bridge is located on the boundary of two MPOs
    - The Delaware Valley Regional Planning Commission and North Jersey Transportation Planning Authority
  - Report
    - Delaware Valley Regional Planning Commission|North Jersey Transportation Planning Authority
    - Or DVRPC|NJTPA if agency uses abbreviations

1.3 - Classification

- B.CL.01 Owner
- B.CL.02 Maintenance Responsibility
- B.CL.03 Federal or Tribal Land Access
- B.CL.04 Historic Significance
- B.CL.05 Toll
- ***B.CL.06 Emergency Evacuation Designation***

B.CL.06 Emergency Evacuation Designation

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- Format AN (1), Frequency I
- Report whether the route carried on the bridge is an emergency evacuation route using one of the following codes
  - N - Not an Emergency evacuation route
  - Y - Emergency evacuation route
- Emergency evacuation routes may be designated for various events such as hurricanes, earthquakes, tsunami, dam failure, and other hazardous events
  - State Emergency Management Agency may need consulted for designated emergency evacuation routes

2.1 - Span Material and Type

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- B.SP.01 Span Configuration Designation (many-to-one)
- B.SP.02 Number of Spans
- ***B.SP.03 Number of Beam Lines***
- B.SP.04 Span Material
- B.SP.05 Span Continuity
- B.SP.06 Span Type
- ***B.SP.07 Span Protective System***
- ***B.SP.08 Deck Interaction***
- B.SP.09 Deck Material and Type
- B.SP.10 Wearing Surface
- B.SP.11 Deck Protective System
- B.SP.12 Deck Reinforcing Protective System
- ***B.SP.13 Deck Stay-In-Place Forms***

B.SP.03 Number of Beam Lines

U.S. Department of Transportation
Federal Highway Administration

- Format N (3,0), Frequency I
- Report the number of principal beam lines
- Report 1 for bridges where Item B.SP.06 (Span Type) is F01, F02, S01, or S02
  - Frame – three-sided (F01) or four-sided (F02)
  - Slab – solid (S01) or voided (S02)
- Report 0 for bridges where Item B.SP.06 (Span Type) is P01 or P02
  - Pipe – rigid (P01) or flexible (P02)

B.SP.03 Number of Beam Lines

U.S. Department of Transportation
Federal Highway Administration

- Principal beam lines
  - Main longitudinal load-carrying members of the superstructure such as beams, girders, trusses, and arches or arch ribs
  - Do not include stringers of a floor beam system or spandrel walls of an arch
- Use the average number of beam lines for bridges with variable number of beam lines within a span configuration, rounded down

B.SP.03 Number of Beam Lines

U.S. Department of Transportation
Federal Highway Administration

- Example 1
  - Steel through truss bridge with two trusses and ten stringers
  - Report 2
- Example 2
  - Flared three-span tee-beam bridge with 12 beams at the south end and 17 beams at the north end
  - Report 14
- Example 3
  - Three-sided frame culvert, lengthened by adding a four-sided box culvert to the end of the barrel. This bridge has two span data sets.
  - Report 1 for the three-sided frame data set
  - Report 1 for the four-sided frame data set

B.SP.07 Span Protective System

U.S. Department of Transportation
Federal Highway Administration

- Format AN (3), Frequency I
- Report the span protective system using one of the following codes
  - 0 None
    - Use when the span is unprotected
    - Use when unprotected steels either never were coated or currently have no signs of coating systems, and have no protective systems such as cathodic protection or weathering chemistry
  - A01 Admixture – internally sealed
  - A02 Admixture – low permeability
  - A03 Admixture – polymer impregnated
  - A04 Admixture – corrosion inhibitor
  - A05 Admixture – ASR inhibitor
  - AX Admixture – other

B.SP.07 Span Protective System

U.S. Department of Transportation
Federal Highway Administration

- Codes continued
  - C01 Coating – paint
    - Use for weathering steel that has been painted
    - Use for paints and stains on timber
  - C02 Coating – sealer
    - Use for sealers such as silanes, siloxanes, linseed oils, etc.
  - C03 Coating – hot dip galvanizing
  - C04 Coating – metalizing/thermal spray
  - CX Coating – other
  - E01 Encasement – concrete
  - EX Encasement – other

B.SP.07 Span Protective System

U.S. Department of Transportation
Federal Highway Administration

- Codes continued
  - M01 Membrane – built-up
  - M02 Membrane – sheet
  - M03 Membrane – liquid applied
  - MU Membrane – unknown
  - MX Membrane – other
  - P01 Patina – uncoated weathering steel
    - Use only for weathering grades of steel
  - S01 Sacrificial – cathodic, passive
  - S02 Sacrificial – cathodic, active
  - SX Sacrificial – other

B.SP.07 Span Protective System

U.S. Department of Transportation
Federal Highway Administration

- Codes continued
  - T01 Treated – timber preservative
    - Use for oil-based or water-borne timber preservatives
  - U Unknown
  - X Other
- Code consistent with the material reported for Item B.SP.04 (Span Material)
- Non-protective anti-graffiti and aesthetic coatings are not considered when coding this item

B.SP.07 Span Protective System

U.S. Department of Transportation
Federal Highway Administration

- In cases where the span configuration may have a combination of protective systems
  - Use the code for the predominant protective system based on protected area
- In cases where multiple systems protect the same area
  - Use the code for the outermost protective layer
- Use appropriate code for span members under fill that have a protective system

B.SP.08 Deck Interaction

U.S. Department of Transportation
Federal Highway Administration

- Format AN (2), Frequency I
- Captures the type of structural interaction that occurs between the bridge deck and superstructure, which may indicate the importance of the deck to the overall stability and capacity of the bridge
- Report the type of interaction between the superstructure and deck for the span configuration using one of the following codes
  - CS Composite – shored construction
  - CU Composite – unshored construction
  - IM Integral or monolithic
  - NC Non-composite

B.SP.08 Deck Interaction

U.S. Department of Transportation
Federal Highway Administration

- NC - indicates the deck and the superstructure act independently
- CU - indicates the deck acts composite with the superstructure, and the superstructure can carry its own self-weight, plus the deck concrete prior to curing
- CS - indicates the deck acts composite with the superstructure, but without the deck the superstructure requires shoring to carry its own self weight, the weight of the deck concrete prior to curing, or both
- Do not report this item when Item B.SP.09 (Deck Material and Type) is 0 (i.e., None)

B.SP.08 Deck Interaction

U.S. Department of Transportation
Federal Highway Administration

- IM - indicates the deck was cast or fabricated of the same material and at the same time as the superstructure and the two can be expected to act as a unit
  - Use IM for slabs and orthotropic steel decks
- When the type of interaction is unknown
  - Code consistent with the assumption used in the load rating calculations

B.SP.13 Deck Stay-In-Place Forms

U.S. Department of Transportation
Federal Highway Administration

- Format AN (3), Frequency I
- Report the type of deck stay-in-place form for the span configuration using one of the following codes
  - 0 None
  - C01 Concrete – reinforced
    - Use when a precast reinforced concrete panel (partial depth) is used with a cast-in-place reinforced concrete placement on top
  - C02 Concrete – prestressed
    - Use when a precast prestressed concrete panel (partial depth) is used with a cast-in-place reinforced concrete placement on top

B.SP.13 Deck Stay-In-Place Forms

U.S. Department of Transportation
Federal Highway Administration

- Codes continued
  - F01 FRP composite
  - M01 Metal
  - T01 Timber
  - X Other
- When a span configuration has a combination of stay-in-place form types
  - Code the predominant type based on the deck area
- Not intended to be used for materials installed only for debris shielding, or when Item B.SP.09 (Deck Material and Type) is S05 (i.e., Steel – corrugated)

2.2 - Substructure Material and Type

U.S. Department of Transportation
Federal Highway Administration

- Data items in this subsection identify the substructure and foundation material(s) and type(s) for the bridge and are considered part of the Substructure Data Set
  - Items have a many-to-one relationship with a bridge when applicable
- Data items are reported for each substructure configuration present in the bridge
  - A substructure configuration characterizes all substructure units that have the same material, type, and foundation type
  - One or more substructure sets are reported for a bridge when applicable
  - Substructures of similar configuration do not need to be adjacent to be reported in the same data set

2.2 - Substructure Material and Type

U.S. Department of Transportation
Federal Highway Administration

- Data items are not reported when Item B.SP.06 (Span Type) is a pipe (i.e., code P01 or P02)
- Deck and superstructure are not otherwise considered in the determination of a substructure set
- Data typically remain static once a bridge has been inventoried

2.2 - Substructure Material and Type

U.S. Department of Transportation
Federal Highway Administration

- ***B.SB.01 Substructure Configuration Designation (many-to-one)***
- ***B.SB.02 Number of Substructure Units***
- ***B.SB.03 Substructure Material***
- ***B.SB.04 Substructure Type***
- ***B.SB.05 Substructure Protective System***
- ***B.SB.06 Foundation Type***
- ***B.SB.07 Foundation Protective System***

B.SB.01 Substructure Configuration Designation (many-to-one)

U.S. Department of Transportation
Federal Highway Administration

- Format AN (3), Frequency I
- Report the substructure set designation using one of the following codes
  - A## Abutment
  - P## Pier or Bent
  - W## Widening
    - Use for widened portions of abutments or piers/bents with dissimilar substructure construction
- The substructure is the portion of a bridge below the bearings or below the springline of an arch
  - Transfers loads to the foundation
  - Includes walls of three-sided and four-sided rigid frame bridges

B.SB.01 Substructure Configuration Designation (many-to-one)

U.S. Department of Transportation
Federal Highway Administration

- Replace the ## characters in the above codes with sequential numbers, with leading zeros, assigned to each substructure configuration
  - Replacing the "##" characters in the codes with a sequential number (e.g., A01, A02, P01, etc.) identifies each unique substructure configuration present on the bridge
- An abutment is a substructure unit located at the end of a bridge
  - Transfers loads from the superstructure to the foundation
  - Provides lateral support for the approach roadway embankment
  - Typically, a bridge has two abutments
  - There may be cases (such as bifurcated structures assigned two bridge numbers) where one end of the bridge does not mate up with the approach roadway

B.SB.01 Substructure Configuration Designation (many-to-one)

U.S. Department of Transportation
Federal Highway Administration

- A multiple span bridge with cantilevered end spans that are unsupported at the extreme ends does not have abutments
- Piers and bents are substructure units that support the spans of a multi-span superstructure at intermediate location(s) between abutments

B.SB.01 Substructure Configuration Designation (many-to-one)

U.S. Department of Transportation
Federal Highway Administration

- Example
  - Five-span girder bridge with concrete stub abutments (A01) and concrete wall piers (P01)
  - Bridge is widened with concrete stub abutments and concrete column piers (W01)
  - This bridge has three designated substructure data sets
    - Report A01 for the stub abutments (including the widening) data set
    - Report P01 for the concrete wall piers data set
    - Report W01 for the concrete columns data set

B.SB.02 Number of Substructure Units

U.S. Department of Transportation
Federal Highway Administration

- Format N (3,0), Frequency I
- Report the number of substructure units of similar material, design, and foundation type
- Example
  - Four-span multi-beam bridge with integral concrete abutments and concrete column piers. This bridge has two substructure data sets.
    - Report 2 for the abutment data set.
    - Report 3 for the pier data set.

B.SB.03 Substructure Material

U.S. Department of Transportation
Federal Highway Administration

- AN (3), Frequency I
- Reflects the material which provides the support for the transfer of the superstructure load to the foundation
- Report the principal substructure material type using one of the following codes
  - 0 None
    - Use when the superstructure rests directly on the foundation
  - A01 Aluminum

B.SB.03 Substructure Material

U.S. Department of Transportation
Federal Highway Administration

- Codes continued
  - C01 Reinforced concrete – cast-in-place
    - Use for cased and uncased cast-in-place concrete piles, and for driven corrugated, fluted, or spiral-welded shell-cased concrete piles
  - C02 Reinforced concrete – precast
  - C03 Prestressed concrete – pre-tensioned

B.SB.03 Substructure Material

U.S. Department of Transportation
Federal Highway Administration

- Codes continued
  - C04 Prestressed concrete – cast-in-place post-tensioned
    - Use as applicable, for prestressed concrete substructure unit(s) that utilize both pre-tensioning and post-tensioning
  - C05 Prestressed concrete – precast post-tensioned
    - Use as applicable, for prestressed concrete substructure unit(s) that utilize both pre-tensioning and post-tensioning
  - CX Concrete – other

B.SB.03 Substructure Material

U.S. Department of Transportation
Federal Highway Administration

- Codes continued
  - E01 Earth – reinforced soil
    - Use when the superstructure rests directly on the reinforced soil mass
    - Not intended to be used for MSE walls when the superstructure does not rest directly on the reinforced soil mass
  - F01 FRP composite – aramid fiber
  - F02 FRP composite – carbon fiber
  - F03 FRP composite – glass fiber
  - FX FRP composite – other
  - ***I01*** Iron – cast
  - ***I02*** Iron – wrought

B.SB.03 Substructure Material

U.S. Department of Transportation
Federal Highway Administration

- Codes continued
  - M01 Masonry – block
    - Use for masonry made from bricks or concrete blocks
  - M02 Masonry – stone
    - Use for natural stone
  - P01 Plastic – Polyethylene
  - PX Plastic – other

B.SB.03 Substructure Material

U.S. Department of Transportation
Federal Highway Administration

- Codes continued
  - S01 Steel – rolled shapes
  - S02 Steel – welded shapes
  - S03 Steel – bolted shapes
  - S04 Steel – riveted shapes
  - S05 Steel – bolted and riveted shapes
  - S06 Steel – pipe
    - Use for filled or unfilled steel pipe piles
  - SX Steel – other

B.SB.03 Substructure Material

U.S. Department of Transportation
Federal Highway Administration

- Codes continued
  - T01 Timber – glue laminated
  - T02 Timber – nail laminated
  - T03 Timber – solid sawn
  - T04 Timber – stress laminated
  - TX Timber – other
  - X Other
- Example
  - GRS abutment with precast, prestressed concrete box beams placed directly on the reinforced soil mass
  - Report E01

B.SB.04 Substructure Type

U.S. Department of Transportation
Federal Highway Administration

- AN (3), Frequency I
- Report the abutment, pier, or bent design type using one of the following codes
  - 0 None
    - Use when the superstructure rests directly on the foundation
  - A01 Abutment – cantilever/wall
    - Use A01 to A10, as appropriate, if the superstructure load is supported by a substructure unit, which in turn is supported by piles or the reinforced soil mass
  - A02 Abutment – stub
  - A03 Abutment – open/spill through
  - A04 Abutment – integral
  - A05 Abutment – semi-integral

B.SB.04 Substructure Type

U.S. Department of Transportation
Federal Highway Administration

- Codes continued
  - A06 Abutment – gravity
  - A07 Abutment – counterfort
  - A08 Abutment – pile bent with lagging
  - A09 Abutment – crib
  - A10 Abutment – cellular/vaulted
    - Use when the space between wingwalls, abutment stem, approach slab, and footings is hollow
  - A11 Abutment – reinforced soil
    - Use when the superstructure rests directly on the reinforced soil mass
  - A12 Abutment – footing only
    - Use when the superstructure rests only on a footing, grade beam, or thrust block
  - AX Abutment – other

B.SB.04 Substructure Type

U.S. Department of Transportation
Federal Highway Administration

- Codes continued
  - B01 Bent – column or open
  - B02 Bent – column with web wall
  - B03 Bent – pile
  - B04 Bent – straddle or c-shaped
    - Use when a highway or railroad passes directly beneath or through the bent
  - BX Bent – other

B.SB.04 Substructure Type

U.S. Department of Transportation
Federal Highway Administration

- Codes continued
  - P01 Pier – wall
  - P02 Pier – single column
  - P03 Pier – multiple column
  - P04 Pier – multiple column with web wall
  - P05 Pier – straddle or c-shaped
  - P06 Pier – movable bridge
    - Use for piers that support movable bridges and the equipment needed to open and close the bridge

B.SB.04 Substructure Type

U.S. Department of Transportation
Federal Highway Administration

- Codes continued
  - P07 Pier – tower
    - Use for towers of complex bridges such as cable-stayed and suspension bridges
  - P08 Pier – footing only
    - Use when the superstructure rests only on a footing, grade beam, or thrust block
  - PX Pier – other
  - U Unknown
  - X Other

B.SB.04 Substructure Type

U.S. Department of Transportation
Federal Highway Administration

- In cases where the substructure may have a combination of designs due to retrofitting actions
  - Use code for the predominant design
- Both piers and bents provide the same function
  - Pier has only one footing at each substructure unit
    - Footing may serve as a pile cap
  - Bent has several footings or no footing, as is the case with a pile bent

B.SB.05 Substructure Protective System

U.S. Department of Transportation
Federal Highway Administration

- AN (3), Frequency I
- Code consistent with the predominant material reported in Item B.SB.03 (Substructure Material)
- Do not report this item when Item B.SB.04 (Substructure Type) is 0.
- Report the substructure protective system using one of the following codes
  - 0 None
    - Use when the substructure is unprotected
    - Use when unprotected steels either never were coated or currently have no signs of coating systems and have no protective systems, such as, cathodic protection or weathering chemistry

B.SB.05 Substructure Protective System

U.S. Department of Transportation
Federal Highway Administration

- Codes continued
  - A01 Admixture – internally sealed
  - A02 Admixture – low permeability
  - A03 Admixture – polymer impregnated
  - A04 Admixture – corrosion inhibitor
  - A05 Admixture – ASR inhibitor
  - AX Admixture – other

B.SB.05 Substructure Protective System

U.S. Department of Transportation
Federal Highway Administration

- Codes continued
  - C01 Coating – paint
    - Use for weathering steel that has been painted
    - Use for paints and stains on timber
  - C02 Coating – sealer
    - Use for sealers such as silanes, siloxanes, linseed oils, etc.
  - C03 Coating – galvanizing/metalizing
  - CX Coating – other
- Anti-graffiti coatings are not considered

B.SB.05 Substructure Protective System

U.S. Department of Transportation
Federal Highway Administration

- Codes continued
  - E01 Encasement – concrete
    - Use for steel piles of pile bents that are encased in concrete
  - EX Encasement – other
  - P01 Patina – weathering steel
    - Use only for weathering grades of steel
  - S01 Sacrificial – cathodic, passive
  - S02 Sacrificial – cathodic, active
  - SX Sacrificial – other
  - T01 Treated – timber preservative
    - Use for oil-based or water-borne timber preservatives
  - X Other

B.SB.06 Foundation Type

U.S. Department of Transportation
Federal Highway Administration

- AN (3), Frequency I
- Do not consider localized repairs to original foundation types
- Report the foundation type using one of the following codes
  - E01 Earth – reinforced soil
    - Use when the superstructure bears directly on the reinforced soil mass
  - F01 Footing – not on rock
  - F02 Footing – on rock
    - Use only if the design plans, or subsequent subsurface investigation, indicate that the entire foundation is supported by rock
  - F03 Footing – on reinforced soil
    - Use if the superstructure load is supported by a substructure unit, which is supported by the reinforced soil mass

B.SB.06 Foundation Type

U.S. Department of Transportation
Federal Highway Administration

- Codes continued
  - P01 Pile – steel H-shape
  - P02 Pile – steel pipe
    - Use for filled or unfilled steel pipe piles
  - P03 Pile – concrete, cast-in-place
    - Use for cased and uncased cast-in-place concrete piles, and for driven corrugated, fluted, or spiral-welded shell-cased concrete piles
  - P04 Pile – prestressed concrete
    - Use for solid or hollow-core square, octagonal, or cylindrical piles
  - P05 Pile – timber

B.SB.06 Foundation Type

U.S. Department of Transportation
Federal Highway Administration

- Codes continued
  - P06 Pile – auger cast
    - Use for piles that have concrete or grout placed by pumping through the stem of the auger pipe as the auger is withdrawn
  - P07 Pile – micropile
    - Use for small diameter piles, typically less than 12 inches, that are drilled, then grouted
  - P08 Pile – composite
    - Use for piles in which the length is composed of two or more pile types or materials, excluding pile tips
  - P09 Pile – FRP composite
    - Use when FRP composite piles are used for construction but not as repairs to existing piles of a different type
  - PX Pile – other

B.SB.06 Foundation Type

U.S. Department of Transportation
Federal Highway Administration

- Codes continued
  - S01 Drilled shaft – single
    - Use for cased or uncased drilled shafts
  - S02 Drilled shafts – multiple
    - Use for cased or uncased drilled shafts
  - S03 Caisson
    - Use for footings sunk into position by excavation through or beneath the caisson structure
  - U Unknown
  - X Other

B.SB.06 Foundation Type

U.S. Department of Transportation
Federal Highway Administration

- Example
  - Three-sided concrete frame culvert with a spread footing keyed into bedrock (F02)
  - Modified by adding a four-sided box culvert placed on crushed stone bedding (F01) to the end of the barrel to widen the culvert
  - This culvert has two substructure data sets.
    - Report F02 (Footing – on rock) for the three-sided concrete frame culvert data set
    - Report F01 (Footing – not on rock) for the four-sided box culvert data set

B.SB.07 Foundation Protective System

U.S. Department of Transportation
Federal Highway Administration

- AN (3), Frequency I
- Code consistent with the predominant material reported in Item B.SB.06 (Foundation Type)
- Report the foundation protective system using one of the following codes
  - 0 None
    - Use when the foundation is unprotected
    - Use when unprotected steels either never were coated or currently have no signs of coating systems and have no protective systems, such as cathodic protection or weathering chemistry

B.SB.07 Foundation Protective System

U.S. Department of Transportation
Federal Highway Administration

- Codes continued
  - A01 Admixture – internally sealed
  - A02 Admixture – low permeability
  - A03 Admixture – polymer impregnated
  - A04 Admixture – corrosion inhibitor
  - A05 Admixture – ASR inhibitor
  - AX Admixture – other

B.SB.07 Foundation Protective System

U.S. Department of Transportation
Federal Highway Administration

- Codes continued
  - C01 Coating – paint
    - Use for paints and stains on timber
  - C02 Coating – sealer
    - Use for sealers such as silanes, siloxanes, linseed oils, etc.
  - C03 Coating – galvanizing/metalizing
  - CX Coating – other
- Anti-graffiti coatings are not considered

B.SB.07 Foundation Protective System

U.S. Department of Transportation
Federal Highway Administration

- Codes continued
  - E01 Encasement – concrete
    - Use for steel piles of pile bents that are encased in concrete
  - EX Encasement – other
  - P01 Patina – weathering steel
    - Use only for weathering grades of steel
  - S01 Sacrificial – cathodic, passive
  - S02 Sacrificial – cathodic, active
  - SX Sacrificial – other

B.SB.07 Foundation Protective System

U.S. Department of Transportation
Federal Highway Administration

- Codes continued
  - T01 Treated – timber preservative
    - Use for oil-based or water-borne timber preservatives
  - U Unknown
  - X Other

2.3 - Roadside Hardware

U.S. Department of Transportation
Federal Highway Administration

- B.RH.01 Bridge Railings
- B.RH.02 Transitions

These items are not considered “new”, but reported data is different.

3 - Bridge Geometry

U.S. Department of Transportation
Federal Highway Administration

- B.G.01 NBIS Bridge Length
- B.G.02 Total Bridge Length
- B.G.03 Maximum Span Length
- ***B.G.04 Minimum Span Length***
- B.G.05 Bridge Width Out-to-Out
- B.G.06 Bridge Width Curb-to-Curb
- B.G.07 Left Curb or Sidewalk Width
- B.G.08 Right Curb or Sidewalk Width
- B.G.09 Approach Roadway Width
- B.G.10 Bridge Median
- B.G.11 Skew
- ***B.G.12 Curved Bridge***
- ***B.G.13 Maximum Bridge Height***
- ***B.G.14 Sidehill Bridge***
- ***B.G.15 Irregular Deck Area***
- ***B.G.16 Calculated Deck Area***

B.G.04 Minimum Span Length

U.S. Department of Transportation
Federal Highway Administration

- Format N (5,1), Frequency I
- Report the length to the nearest tenth of foot, measured from centerline of bearing to centerline of bearing, along the roadway centerline
  - Use the clear open distance between piers, bents, or abutments for rigid frames, arches, pipes, integral abutments, or similar type bridges where there is not a clear centerline of bearing
  - Roadway centerline is the physical center of the portion of the roadway for the movement of vehicles, regardless of striping, and exclusive of shoulders
- This item has the same value as B.G.03 (Maximum Span Length) for bridges with single spans

B.G.12 Curved Bridge

U.S. Department of Transportation
Federal Highway Administration

- AN (2), Frequency I
- Report whether the bridge is horizontally curved using one of the following codes
  - CU Curved girder(s)
  - CP Piecewise straight girders
  - CK Kinked girder(s)
  - N Not curved
    - Use for bridges that have curved deck geometry, or may be striped as curved, but the girders do not form a curve

B.G.12 Curved Bridge

U.S. Department of Transportation
Federal Highway Administration

- A bridge is considered horizontally curved when at least one girder line forms a curve using either
  - Curved girder(s)
  - Piecewise straight girders forming a segmented/chorded curve
    - A piecewise straight girder line is comprised of girders with a longitudinal axis that changes orientation at one or more supports
    - Girder line may be simply supported or continuous at supports
  - Kinked girder(s)
    - A girder with a longitudinal axis that changes orientation at a location(s) along the girder length excluding at the supports
- Diaphragm and cross-frame members in horizontally curved bridges are primary members

B.G.13 Maximum Bridge Height

U.S. Department of Transportation
Federal Highway Administration

- Format N (4,0), Frequency I
- Record the maximum height from top of deck to ground line or water surface elevation, whichever yield the largest value, rounded to the nearest foot
  - Ground line represents dry terrain, pavement, or waterway bottom
  - Use the water surface elevation at the time the value for this item is established
  - Does not need to be updated due to fluctuations in water surface elevation
- May be estimated by field observation or from plans when it is not practical or is infeasible to measure, or height is more than 30 ft

B.G.14 Sidehill Bridge

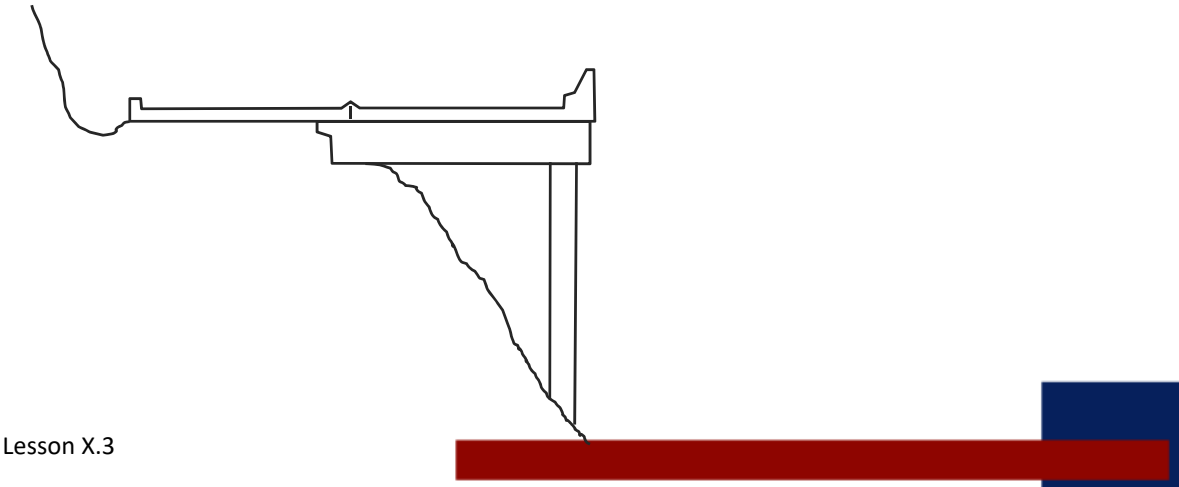
U.S. Department of Transportation
Federal Highway Administration

- Format AN (1), Frequency I
- Report whether any portion of the bridge is a sidehill structure
  - N Not a sidehill bridge
    - Use when no portion of the bridge is a sidehill structure
  - Y Is a sidehill bridge
- Item B.G.06 (Bridge Width Curb-to-Curb) is typically larger than Item B.G.05 (Bridge Width Out-to-Out)
- For sidehill bridges with irregular geometry, reporting the actual deck area in Item B.G.15 (Irregular Deck Area) provides a more accurate value than using the default calculation described for that item

B.G.14 Sidehill Bridge

U.S. Department of Transportation
Federal Highway Administration

- A structure built onto the side of terrain or earth material with the roadway centerline running nearly parallel to the face of the terrain or material
- Roadway is carried partially on structure and partially on terrain that has been modified by cutting or filling to form the required roadway subgrade elevation



B.G.15 Irregular Deck Area

U.S. Department of Transportation
Federal Highway Administration

- Format N (10,1), Frequency I
- Report the total deck area rounded to the nearest tenth of a square foot
  - Only report this item when the actual area is obtained from plans or measurement of bridges with irregular geometry
- The limits of measurement shall be in accordance with Items B.G.05 (Bridge Width Out-to-Out) and B.G.02 (Total Bridge Length)
- For bridges that carry multiple types of service, for example highway and railroad, report the deck area that encompasses all service types

B.G.15 Irregular Deck Area

U.S. Department of Transportation
Federal Highway Administration

- Reporting the deck area calculated from plans may more accurately reflect the deck area for bridges with unusual geometry
  - Flared, sidehill, or bifurcated structures, or through structures with cantilevered sidewalks
- This item can improve the accuracy of national performance measure computations, estimating cost, etc.

B.G.16 Calculated Deck Area

U.S. Department of Transportation
Federal Highway Administration

- Format N (10,1), Frequency C
- Do not report this item as it is calculated by FHWA
- The default calculation for bridges is the value reported in Item B.G.05 (Bridge Width Out-to-Out) multiplied by the value reported in Item B.G.02 (Total Bridge Length) rounded to the nearest tenth of a square foot

4.1 - Feature Identification

U.S. Department of Transportation
Federal Highway Administration

- B.F.01 Feature Type (many-to-one)
- B.F.02 Feature Location
- B.F.03 Feature Name

These items are not considered “new”, but reported data is different.

4.2 - Routes

- ***B.RT.01 Route Designation (many-to-one)***
- B.RT.02 Route Number
- B.RT.03 Route Direction
- B.RT.04 Route Type
- B.RT.05 Service Type

B.RT.01 Route Designation (many-to-one)

U.S. Department of Transportation
Federal Highway Administration

- Format AN (3), Frequency I
- This item captures how routes that share the reported highway feature are designated
- Each highway feature has at least one route designation
- Report the assigned route designation for the highway reported in Item B.F.01 (Feature Type) using the following code
  - R## Unique Route Designation
    - Replace the ## characters with sequential numbers, with leading zeros, assigned to each unique route designation carried on the highway feature (e.g., R01, R02)

B.RT.01 Route Designation (many-to-one)

U.S. Department of Transportation
Federal Highway Administration

- If a highway carries multiple routes, report only those routes that have a route number
- If a highway carries only routes without route numbers, report one route designation
- Typically, the route with the highest-class route type is listed first, using the hierarchy shown in Item B.RT.04 (Route Type)
  - An interstate is considered the highest-class route

B.RT.01 Route Designation (many-to-one)

U.S. Department of Transportation
Federal Highway Administration

- If the highway feature is carried on a ramp bridge, report all applicable routes for the highways that are being connected
- For border bridges, the Neighboring State reports this item for all highway features carried on the bridge, as part of their abbreviated bridge record

4.3 - Highways

U.S. Department of Transportation
Federal Highway Administration

- B.H.01 Functional Classification
- B.H.02 Urban Code
- B.H.03 NHS Designation
- B.H.04 National Highway Freight Network
- B.H.05 STRAHNET Designation
- B.H.06 LRS Route ID
- B.H.07 LRS Mile Point
- B.H.08 Lanes on Highway
- B.H.09 Annual Average Daily Traffic
- B.H.10 Annual Average Daily Truck Traffic
- B.H.11 Year of Annual Average Daily Traffic
- B.H.12 Highway Maximum Usable Vertical Clearance
- B.H.13 Highway Minimum Vertical Clearance
- B.H.14 Highway Minimum Horizontal Clearance, Left
- B.H.15 Highway Minimum Horizontal Clearance, Right
- B.H.16 Highway Maximum Usable Surface Width
- B.H.17 Bypass Detour Length
- ***B.H.18 Crossing Bridge Number***

B.H.18 Crossing Bridge Number

U.S. Department of Transportation
Federal Highway Administration

- Format AN (15), Frequency I
- Intent is to capture the bridge number for bridges of a multi-level interchange, where bridges pass directly above or below other bridges
- Report the exact bridge number(s) as assigned in Item B.ID.01 (Bridge Number) for the bridge carrying a highway feature that is located directly above or below the inventoried highway bridge

B.H.18 Crossing Bridge Number

U.S. Department of Transportation
Federal Highway Administration

- Do not report this item when the highway bridge does not pass above or below another bridge, or passes above or below a bridge that is not reportable to the NBI
- For border bridges, the Neighboring State reports this item for all highway features that pass above the bridge, as part of their abbreviated bridge record

4.4 - Railroads

- ***B.RR.01 Railroad Service Type***
- B.RR.02 Railroad Minimum Vertical Clearance
- B.RR.03 Railroad Minimum Horizontal Offset

B.RR.01 Railroad Service Type

U.S. Department of Transportation
Federal Highway Administration

- Format AN (2), Frequency I
- Report the designated railroad service type for the railroad feature reported in Item B.F.01 (Feature Type) using one of the following codes
  - F Freight
  - FE Freight - electrified
  - P Passenger
  - PE Passenger - electrified

B.RR.01 Railroad Service Type

U.S. Department of Transportation
Federal Highway Administration

- Codes continued
  - M Multiple services - not electrified
    - Use when multiple rail services (such as freight and passenger rail) use the same tracks and both services are not electrified
  - ME Multiple services – electrified
    - Use when multiple rail services (such as freight and passenger rail) use the same tracks, and at least one is electrified
  - I Inactive
- Electrified is intended for electricity-powered rail lines and third-rails, but not for battery or fuel cell powered lines

4.5 - Navigable Waterways

U.S. Department of Transportation
Federal Highway Administration

- B.N.01 Navigable Waterway
- B.N.02 Navigation Minimum Vertical Clearance
- B.N.03 Movable Bridge Maximum Navigation Vertical Clearance
- B.N.04 Navigation Channel Width
- ***B.N.05 Navigation Channel Minimum Horizontal Clearance***
- B.N.06 Substructure Navigation Protection

B.N.05 Navigation Channel Minimum Horizontal Clearance

U.S. Department of Transportation
Federal Highway Administration

- Format N (5,1), Frequency I
- Report this item only when Item B.N.01 (Navigable Waterway) is Y
- The intent is to collect the most restrictive distance from the edge of the navigational channel to a bridge substructure to assess risk for vessel collision
- Report the minimum horizontal clearance for the waterway feature reported in Item B.F.01 (Feature Type), rounded down to the nearest tenth of a foot

B.N.05 Navigation Channel Minimum Horizontal Clearance

U.S. Department of Transportation
Federal Highway Administration

- Clearance is the minimum distance from either edge of the navigation channel shown on the approved permit plans, to the face of the nearest bridge substructure unit located within the waterway
- Report 0 when substructure units in the waterway are the boundaries for the navigation channel
- Report 9999.9 when no substructure unit is within the waterway

B.N.05 Navigation Channel Minimum Horizontal Clearance

U.S. Department of Transportation
Federal Highway Administration

- The clearance may be field measured when the placement of navigation markers at the bridge is inconsistent with the permit plans, or if the presence of navigation markers indicates a navigation channel and no permit plans are available
- For field measurements, measure the horizontal distance perpendicular to the centerline of the navigation channel from the markers designating the limits of the channel at the bridge, to the face of the nearest bridge substructure unit located within the waterway

5.1 - Loads and Load Rating

U.S. Department of Transportation
Federal Highway Administration

- B.LR.01 Design Load
- ***B.LR.02 Design Method***
- ***B.LR.03 Load Rating Date***
- B.LR.04 Load Rating Method
- B.LR.05 Inventory Load Rating Factor
- B.LR.06 Operating Load Rating Factor
- B.LR.07 Controlling Legal Load Rating Factor
- ***B.LR.08 Routine Permit Loads***

B.LR.02 Design Method

U.S. Department of Transportation
Federal Highway Administration

- Format AN (4), Frequency I
- Report the method by which the bridge was designed using one of the following codes
  - ASD Allowable Stress Design
  - LFD Load Factor Design
  - LRFD Load and Resistance Factor Design
  - U Unknown
    - Use when the design plans are not available, and the likely design method cannot be inferred from design characteristics of the bridge or agency policy at the time the bridge was built
  - X Other

B.LR.02 Design Method

U.S. Department of Transportation
Federal Highway Administration

- Codes describe the design methods used in accordance with AASHTO design specifications
- For widened or rehabilitated bridges, code the design method associated with the code in Item B.LR.01 (Design Load)
- A code other than U can be reported when design plans are not available, but the design method can be inferred from design characteristics of the bridge or agency policy at the time the bridge was built

B.LR.03 Load Rating Date

U.S. Department of Transportation
Federal Highway Administration

- Format YYYYMMDD, Frequency I
- Reflects the date of the most recent calculation or reevaluation of the load rating
- Report the date of the most recent load rating
- Do not report this item if no rating analysis or evaluation has been performed

B.LR.03 Load Rating Date

U.S. Department of Transportation
Federal Highway Administration

- The load rating may be performed independently and at a different date than the inspection
- Defects discovered during inspections that may impact the strength or serviceability of the bridge typically require reevaluation of the load rating
- When reevaluation of the load rating is completed, report the date of the reevaluation for this item

B.LR.03 Load Rating Date

U.S. Department of Transportation
Federal Highway Administration

- Refer to the following items when a new or updated load rating is completed
  - B.LR.04 (Load Rating Method)
  - B.LR.05 (Inventory Load Rating Factor)
  - B.LR.06 (Operating Load Rating Factor)
  - B.LR.07 (Controlling Legal Load Rating Factor)
  - B.LR.08 (Routine Permit Loads)

B.LR.08 Routine Permit Loads

U.S. Department of Transportation
Federal Highway Administration

- Format AN (1), Frequency I
- Used to identify bridges where State routine permit loads must be considered in load rating and posting evaluations and to identify bridges where routine permit loads are restricted due to bridge load capacity limitations

B.LR.08 Routine Permit Loads

U.S. Department of Transportation
Federal Highway Administration

- Report whether the bridge carries routine permit loads or whether routine permit loads are restricted from the bridge using one of the following codes
  - A Bridge carries routine permit loads. Load capacity is adequate for all routine permit loads; no routine permit loads are restricted
  - B Bridge carries routine permit loads. Load capacity is adequate for some routine permit loads but some routine permit loads are restricted
  - C Bridge does not carry routine permit loads. Routine permit loads are restricted from the bridge
    - Use when the agency issues routine permits, but all routine permit loads are restricted from the bridge
  - N Bridge does not carry routine permit loads. Agency does not issue routine permits.

B.LR.08 Routine Permit Loads

U.S. Department of Transportation
Federal Highway Administration

- Agencies have varying policies for issuing routine permits, from not issuing routine permits to issuing various routine permits when these loads exceed State legal loads
- Some agencies may utilize maps that indicate highways and bridges that are restricted to routine permit loads or that allow routine permit loads

5.2 - Load Posting Status

U.S. Department of Transportation
Federal Highway Administration

- B.PS.01 Load Posting Status
- ***B.PS.02 Posting Status Change Date*** (many-to-one)

B.PS.02 Posting Status Change Date (many-to-one)

U.S. Department of Transportation
Federal Highway Administration

- Format YYYYMMDD, Frequency I
- Report the date the bridge entered the status reported in Item B.PS.01 (Load Posting Status)
- For bridges entering posted status, it is preferable that the reported date represent the date on which signs were properly installed at the bridge
- The date the load posting became legally enforceable can also be used for this item when the installation date is unknown
- When neither the installation nor legal enforcement date are known, the date the posting was first documented to be in place can be used for this item

5.3 - Load Evaluation and Posting

U.S. Department of Transportation
Federal Highway Administration

- ***B.EP.01 Legal Load Configuration (many-to-one)***
- B.EP.02 Legal Load Rating Factor
- ***B.EP.03 Posting Type***
- ***B.EP.04 Posting Value***

B.EP.01 Legal Load Configuration (many-to-one)

U.S. Department of Transportation
Federal Highway Administration

- Format AN (3), Frequency I
- Report the configuration of the AASHTO legal load using one of the following codes
  - 3 Type 3
  - 3S2 Type 3S2
  - 3-3 Type 3-3
  - SU4 SU4 truck
  - SU5 SU5 truck
  - SU6 SU6 truck
  - SU7 SU7 truck
  - NRL Notional Rating Load
  - EV2 Type EV2 emergency vehicle
  - EV3 Type EV3 emergency vehicle

B.EP.03 Posting Type

U.S. Department of Transportation
Federal Highway Administration

- Format AN (1), Frequency I
- This item is only reported for legal load configurations with a rating factor less than 1.0, as reported in Item B.EP.02 (Legal Load Rating Factor)
- Report the type of posting at the bridge restricting the vehicle reported in Item B.EP.01 (Legal Load Configuration) using one of the codes
  - G Gross Load
  - A Single Axle Load
  - D Tandem Axle Load
  - T Truck Load

B.EP.03 Posting Type

U.S. Department of Transportation
Federal Highway Administration

- Codes continued
  - C No commercial vehicles
  - S Speed reduction
  - L Number of lanes restricted
  - V Number of vehicles restricted
  - X Other
- Do not report this item if no posting sign is used for the legal load configuration

B.EP.04 Posting Value

U.S. Department of Transportation
Federal Highway Administration

- Format N (2,0), Frequency I
- This item is only reported for legal load configurations with a rating factor less than 1.0, as reported in Item B.EP.02 (Legal Load Rating Factor)
- Report the weight limit value shown on the load posting sign for the vehicle reported in Item B.EP.02 (Legal Load Rating Factor) rounded down to the nearest U.S. ton

B.EP.04 Posting Value

U.S. Department of Transportation
Federal Highway Administration

- Do not report this item if no posting sign is used for the legal load configuration
- Do not report this item if Item B.EP.03 (Posting Type) has codes C, S, L, or V reported

6.1 - Inspection Requirements

U.S. Department of Transportation
Federal Highway Administration

- B.IR.01 NSTM Inspection Required
- ***B.IR.02 Fatigue Details***
- B.IR.03 Underwater Inspection Required
- ***B.IR.04 Complex Feature***

B.IR.02 Fatigue Details

U.S. Department of Transportation
Federal Highway Administration

- Format AN (1), Frequency I
- Provides data to identify bridges that have details most prone to fatigue
- Report whether the bridge has AASHTO fatigue category E or E' details using one of the following codes
  - N No E/E' details
  - Y E/E' details are present
- Do not report this item for bridges that do not have steel members as indicated in Items B.SP.04 (Span Material) and B.SB.03 (Substructure Material)

B.IR.04 Complex Feature

U.S. Department of Transportation
Federal Highway Administration

- Format AN (1), Frequency I
- Identify bridges with complex features as defined by the NBIS
- Report whether the bridge has a complex feature by using one of the following codes
  - N Bridge does not have complex feature
  - Y Bridge has complex feature
- Bridges with complex features are typically identified in agency policies and procedures

6.2 - Inspection Events

U.S. Department of Transportation
Federal Highway Administration

- B.IE.01 Inspection Type (many-to-one)
- B.IE.02 Inspection Begin Date
- ***B.IE.03 Inspection Completion Date***
- ***B.IE.04 Nationally Certified Bridge Inspector***
- B.IE.05 Inspection Interval
- ***B.IE.06 Inspection Due Date***
- ***B.IE.07 Risk-Based Inspection Interval Method***
- ***B.IE.08 Inspection Quality Control Date***
- ***B.IE.09 Inspection Quality Assurance Date***
- ***B.IE.10 Inspection Data Update Date***
- ***B.IE.11 Inspection Note***
- ***B.IE.12 Inspection Equipment***

B.IE.03 Inspection Completion Date

U.S. Department of Transportation
Federal Highway Administration

- Format YYYYMMDD, Frequency EI
- Intent is to record the field inspection completion dates for all inspections
- Report the completion date for the inspection type performed
- For single day inspections, report the same date that field inspection begins
- If multiple site visits occur for scour monitoring inspections, for a triggering storm event, report the last site visit date for that storm event

B.IE.04 Nationally Certified Bridge Inspector

U.S. Department of Transportation
Federal Highway Administration

- Format AN (15), Frequency EI
- Intent is to indicate the Nationally Certified Bridge Inspector (team leader) present at the inspection, for each inspection type required by the NBIS
- Report the unique code identifying the Nationally Certified Bridge Inspector (team leader) responsible for the inspection type performed

B.IE.04 Nationally Certified Bridge Inspector

U.S. Department of Transportation
Federal Highway Administration

- The unique identifier code is assigned by the State DOT, Federal agency, or Tribal government
- Agencies may choose not to report this item for inspection types defined in the NBIS that do not require a Nationally Certified Bridge Inspector (team leader), even if one is present during the inspection

B.IE.06 Inspection Due Date

U.S. Department of Transportation
Federal Highway Administration

- Format YYYYMMDD, Frequency C
- Do not report this item as it is calculated by the FHWA
- Intent is to provide the inspection due date for the inspection types defined in the B.IE.01 (Inspection Type) where applicable
- The default calculation is the value reported in Item B.IE.03 (Inspection Completion Date) plus the value reported in Item B.IE.05 (Inspection Interval)
- Only calculated for inspection types which have an inspection interval

B.IE.07 Risk-Based Inspection Interval Method

U.S. Department of Transportation
Federal Highway Administration

- Format AN (1), Frequency EI
- Intent is to record the risk-based inspection interval method, described in the NBIS, for determining the inspection interval
- Report the risk-based inspection interval method using one of the following codes
  - N Not applicable
    - Use when Item B.IE.01 (Inspection Type) is 1, 5, 6, 7, 8 or 9.
  - 1 Method 1
  - 2 Method 2

B.IE.07 Risk-Based Inspection Interval Method

U.S. Department of Transportation
Federal Highway Administration

- Method 1
  - When inspection intervals are determined by a simplified assessment of risk to classify each bridge into one of three risk levels with an inspection interval not to exceed 12, 24, or 48 months
- Method 2
  - When inspection intervals are determined by a more rigorous assessment of risk to classify each bridge, or a group of bridges, into one of four risk levels with an inspection interval not to exceed 12, 24, 48, or 72 months

B.IE.08 Inspection Quality Control Date

U.S. Department of Transportation
Federal Highway Administration

- Format YYYYMMDD, Frequency EI
- Intent is to identify inspections that have had independent QC reviews to maintain inspection quality at or above a specified level
- Report the date that the QC review was completed
- Do not report when a QC review was not performed
- Agency QC procedures vary
  - Every inspection might not receive an independent QC review
  - Bridge inspections might be selected for QC reviews based on representative bridge types or other agency defined methods

B.IE.09 Inspection Quality Assurance Date

U.S. Department of Transportation
Federal Highway Administration

- Format YYYYMMDD, Frequency EI
- Intent is to identify inspections that have had independent QA reviews to measure or verify the overall quality of the inspection program
- Report the date that the QA review was completed
- Do not report when a QA review was not performed
- Agency QA procedures vary
  - Definition of a review period and number of inspections reviewed
  - Bridge inspections might be randomly selected for agency QA reviews or selected based on representative bridge type, region, district, or other agency defined bridge populations

B.IE.10 Inspection Data Update Date

U.S. Department of Transportation
Federal Highway Administration

- Format YYYYMMDD, Frequency EI
- Intent is to verify that a complete NBI inspection data set is accepted and entered or updated in the inventory within the timeframes required by the NBIS
- Report the date that the NBI inspection data were entered or updated in the State transportation department, Federal agency, or Tribal government inventory

B.IE.11 Inspection Note

U.S. Department of Transportation
Federal Highway Administration

- Format AN (300), Frequency EI
- Intent is to capture a brief description of the members inspected when limited portions of the bridge are inspected such as for Underwater, NSTM, In-depth, Special, and Damage inspections, or for scour monitoring
- Report a brief description of the members or features inspected when limited portions of the bridge are inspected
  - Use consistent terms to describe similar inspections
- Also used to describe the purpose for Special inspections performed following extreme events such as floods, hurricanes, and earthquakes

B.IE.12 Inspection Equipment

U.S. Department of Transportation
Federal Highway Administration

- Format AN (120), Frequency EI
- Used to provide information about access and inspection equipment used in addition to standard equipment for each inspection
- Report all access and inspection equipment used to perform the inspection using one or more of the codes
  - Report multiple codes separated by pipe (|) delimiters
- Do not report this item if none of the equipment indicated was used

B.IE.12 Inspection Equipment

U.S. Department of Transportation
Federal Highway Administration

- Access equipment codes
  - AN No access equipment used
    - Use when none of the listed access equipment codes apply for the inspection performed
  - A01 Ladder
  - A02 Bucket lift vehicle
  - A03 Under bridge inspection vehicle
  - A04 Rigging
  - A05 Waders
  - A06 Boat
  - A07 Snorkel

B.IE.12 Inspection Equipment

U.S. Department of Transportation
Federal Highway Administration

- Access equipment codes continued
  - A08 SCUBA
  - A09 Surface supplied air
  - A10 Remotely Operated Vehicle (ROV)
    - ROVs include any remotely controlled device used to provide video access to members of a bridge via ground, water surface, or underwater
  - A11 Video pole
  - A12 Borescope
  - A13 Unmanned aerial systems (UAS)
    - Use when UAS, also referred to as drones, are used to supplement inspections
  - A14 Service Traveler
  - AX Other

B.IE.12 Inspection Equipment

U.S. Department of Transportation
Federal Highway Administration

- Inspection equipment codes
  - IN No inspection equipment used
    - Use when none of the listed inspection equipment codes apply for the inspection performed
  - I01 Ultrasonic
  - I02 Ground-penetrating radar
  - I03 Infrared thermography
  - I04 Radiographic testing
  - I05 Impact echo
  - I06 Electromagnetic methods
  - I07 Rebound & penetration methods

B.IE.12 Inspection Equipment

U.S. Department of Transportation
Federal Highway Administration

- Inspection equipment codes continued
  - I08 Acoustic emissions testing
  - I09 Dye penetrant
  - I10 Magnetic particle
  - I11 Eddy current
  - I12 Boring or drilling
  - I13 Underwater imaging
    - Use when underwater imaging technologies such as side scan sonar are used to supplement underwater inspections
  - I14 Depth finder/fathometer
  - I15 Stress wave timer
  - IX Other

B.IE.12 Inspection Equipment

U.S. Department of Transportation
Federal Highway Administration

- Example
  - The bridge was struck by an over-height vehicle requiring a damage inspection
  - A hands-on inspection was performed using a bucket truck (A02) for access
  - Dye penetrant (I09) testing was used in several locations where cracks were suspected
  - The tip of identified cracks was determined using Eddy Current (I11) testing
  - Report ***A02|I09|I11*** for the damage inspection

7.1 - Component Condition Ratings

U.S. Department of Transportation
Federal Highway Administration

- B.C.01 Deck Condition Rating
- B.C.02 Superstructure Condition Rating
- B.C.03 Substructure Condition Rating
- B.C.04 Culvert Condition Rating
- ***B.C.05 Bridge Railing Condition Rating***
- ***B.C.06 Bridge Railing Transitions Condition Rating***
- ***B.C.07 Bridge Bearings Condition Rating***
- ***B.C.08 Bridge Joints Condition Rating***
- B.C.09 Channel Condition Rating
- B.C.10 Channel Protection Condition Rating
- B.C.11 Scour Condition Rating
- ***B.C.12 Bridge Condition Classification***
- ***B.C.13 Lowest Condition Rating Code***
- ***B.C.14 NSTM Inspection Condition***
- ***B.C.15 Underwater Inspection Condition***

B.C.05 Bridge Railing Condition Rating

U.S. Department of Transportation
Federal Highway Administration

- Format AN (1), Frequency EI
- Addresses the condition of all types and shapes of bridge railings (parapets, median barriers, or structure mounted) located on the bridge or that cross over buried structures
  - Condition assessment includes the portions of the railings, posts, blocking, and curbs that are part of the bridge railing system
- Report the bridge railing condition rating using one of the codes in Table 20
- Report N when there are no bridge railings present

B.C.05 Bridge Railing Condition Rating

U.S. Department of Transportation
Federal Highway Administration

- Do not consider pedestrian railings except to the extent that the pedestrian railing is integral to the traffic barrier
- Do not consider the condition of protective coatings and other protection systems except to the extent that problems with the protective coating system are indicative of problems with the underlying railing material

B.C.05 Bridge Railing Condition Rating

U.S. Department of Transportation
Federal Highway Administration

Table 20. Codes and descriptions for component condition ratings

Code	Condition	Description
N	NOT APPLICABLE	Component does not exist.
9	EXCELLENT	Isolated inherent defects.
8	VERY GOOD	Some inherent defects.
7	GOOD	Some minor defects.
6	SATISFACTORY	Widespread minor or isolated moderate defects.
5	FAIR	Some moderate defects; strength and performance of the component are not affected.
4	POOR	Widespread moderate or isolated major defects; strength and/or performance of the component is affected.

B.C.05 Bridge Railing Condition Rating

U.S. Department of Transportation
Federal Highway Administration

Table 20. Codes and descriptions for component condition ratings

Code	Condition	Description
3	SERIOUS	Major defects; strength and/or performance of the component is seriously affected. Condition typically necessitates more frequent monitoring, load restrictions, and/or corrective actions.
2	CRITICAL	Major defects; component is severely compromised. Condition typically necessitates frequent monitoring, significant load restrictions, and/or corrective actions in order to keep the bridge open.
1	IMMINENT FAILURE	Bridge is closed to traffic due to component condition. Repair or rehabilitation may return the bridge to service.
0	FAILED	Bridge is closed due to component condition, and is beyond corrective action. Replacement is required to restore service.

B.C.06 Bridge Railing Transitions Condition Rating

U.S. Department of Transportation
Federal Highway Administration

- Format AN (1), Frequency EI
- Addresses the condition of the transition from the bridge railing to the approach guardrail
  - Condition assessment includes the portions of the railings, posts, blocking, and curbs that are part of the bridge railing transitions
- Report the bridge railing transitions condition rating using one of the codes in Table 20
- Report N when there are no bridge railing transitions present

B.C.06 Bridge Railing Transitions Condition Rating

U.S. Department of Transportation
Federal Highway Administration

- Do not consider the condition of protective coatings and other protection systems when determining the condition rating code except to the extent that problems with the protective coating system are indicative of problems with the underlying railing transition material

B.C.07 Bridge Bearings Condition Rating

U.S. Department of Transportation
Federal Highway Administration

- Format AN (1), Frequency EI
- Addresses the condition of all types and shapes of bridge bearings
- Report the bridge bearing condition rating using one of the codes in Table 20
- Report N for bridges without bearings
- In cases where the bearing device is not visible
  - Condition can be assessed based on alignment, grade across the joint, or other indirect indicators of the condition

B.C.07 Bridge Bearings Condition Rating

U.S. Department of Transportation
Federal Highway Administration

- Do not consider the condition of protective coatings and other protection systems when determining the condition rating code except to the extent that problems with the protective coating system are indicative of problems with the underlying bearing material

B.C.08 Bridge Joints Condition Rating

U.S. Department of Transportation
Federal Highway Administration

- Format AN (1), Frequency EI
- Report the bridge deck joint condition using one of the following codes
  - The entire code description must be satisfied for the code to apply

Code	Condition	Description
N	NOT APPLICABLE	Bridge does not have deck joints.
9	EXCELLENT	Isolated inherent defects.
8	VERY GOOD	Some inherent defects.
7	GOOD	Some minor defects.
6	SATISFACTORY	Widespread minor or isolated moderate defects.
5	FAIR	Some moderate defects.

B.C.08 Bridge Joints Condition Rating

U.S. Department of Transportation
Federal Highway Administration

- Codes continued

Code	Condition	Description
4	POOR	Widespread moderate or isolated major defects.
3	SERIOUS	Some major defects.
2	CRITICAL	Widespread major defects.
1	IMMINENT FAILURE	Joints have failed and are ineffective.
0	FAILED	Joints have failed and present a safety hazard.

B.C.08 Bridge Joints Condition Rating

U.S. Department of Transportation
Federal Highway Administration

- Item addresses the condition of all types and shapes of bridge deck joints
- Condition assessment includes all aspects of the joints such as any seals, headers (metal or concrete), connections, and other metal members
- Do ***not*** consider the condition of protective coatings and other protection systems
  - Except to the extent that problems with the protective coating system are indicative of problems with the underlying joint material

B.C.08 Bridge Joints Condition Rating

U.S. Department of Transportation
Federal Highway Administration

- When a joint is designed as an open joint, leakage or lack of a seal is not considered a defect
- In cases where the joint is ***not*** visible, the condition can be assessed based on other indirect indicators of the condition

B.C.12 Bridge Condition Classification

U.S. Department of Transportation
Federal Highway Administration

- Format AN (1), Frequency C
- This item is calculated by FHWA and is not required to be reported
- The bridge condition classification is indicated using one of the following codes

Code	Condition	Lowest Condition Rating
G	Good	7, 8, or 9
F	Fair	5 or 6
P	Poor	4, 3, 2, 1, or 0

B.C.12 Bridge Condition Classification

U.S. Department of Transportation
Federal Highway Administration

- For the purposes of national performance measures, the method of assessment to determine the classification of a bridge is the minimum (i.e., lowest) condition rating code from the following items
  - B.C.01 (Deck Condition Rating)
  - B.C.02 (Superstructure Condition Rating)
  - B.C.03 (Substructure Condition Rating)
  - B.C.04 (Culvert Condition Rating)

B.C.13 Lowest Condition Rating Code

U.S. Department of Transportation
Federal Highway Administration

- Format AN (1), Frequency C
- Calculated by FHWA and is not required to be reported
- The code for this item is the lowest condition rating code from the following items
  - B.C.01 (Deck Condition Rating)
  - B.C.02 (Superstructure Condition Rating)
  - B.C.03 (Substructure Condition Rating)
  - B.C.04 (Culvert Condition Rating)

B.C.14 NSTM Inspection Condition

U.S. Department of Transportation
Federal Highway Administration

- Format AN (1), Frequency EI
- Report the condition rating of the Non-Redundant Steel Tension Members (NSTM) using one of the codes in Table 20
- Do not report this item when Item B.IR.01 (NSTM Inspection Required) is N
- Represents the condition of NSTM(s) identified to be inspected in the NSTM inspection procedures, and incorporated into the superstructure or substructure condition rating
- For a bridge with NSTM(s) in both the superstructure and substructure, report only the lower of the two condition values for the condition of the NSTM(s)

B.C.15 Underwater Inspection Condition

U.S. Department of Transportation
Federal Highway Administration

- Format AN (1), Frequency EI
- Report the condition rating of the underwater members of the substructure based on the underwater inspection using one of the codes in Table 20
- Do not report this item when Item B.IR.03 (Underwater Inspection Required) is N
- Represents the condition of underwater members identified to be inspected in the underwater inspection procedures, and incorporated into the substructure condition rating

B.C.15 Underwater Inspection Condition

U.S. Department of Transportation
Federal Highway Administration

- If previously reported because an underwater inspection is generally required, it should continue to be reported even for instances of unusually low flow where all portions of the substructure can be inspected by wading and probing, and an underwater inspection is not required
  - Applies only if the low flow condition is truly unusual and is not likely to reoccur during the next inspection interval
- The requirement to report this item may change in the rare circumstance where long-term environmental conditions change for inspection access to underwater portions of the substructure

7.2 - Element Identification

U.S. Department of Transportation
Federal Highway Administration

- B.E.01 Element Number (many-to-one)
- B.E.02 Element Parent Number
- B.E.03 Element Total Quantity

These items are not considered “new” since element data for NHS bridges has been reported to FHWA since April 2015

7.3 - Element Conditions

U.S. Department of Transportation
Federal Highway Administration

- B.CS.01 Element Quantity Condition State One
- B.CS.02 Element Quantity Condition State Two
- B.CS.03 Element Quantity Condition State Three
- B.CS.04 Element Quantity Condition State Four

These items are not considered “new” since element data for NHS bridges has been reported to FHWA since April 2015

7.4 - Appraisal

- B.AP.01 Approach Roadway Alignment
- B.AP.02 Overtopping Likelihood
- B.AP.03 Scour Vulnerability
- ***B.AP.04 Scour Plan of Action***
- ***B.AP.05 Seismic Vulnerability***

B.AP.04 Scour Plan of Action

U.S. Department of Transportation
Federal Highway Administration

- Format AN (1), Frequency I
- Report whether the bridge has a scour plan of action (POA) implemented using one of the following codes
  - 0 A scour POA is not required
    - Use if a bridge was considered scour critical, but now has designed, installed, and fully functional scour countermeasures
  - N A scour POA is required, but not implemented
  - Y A scour POA is required and implemented
- Do not report this item if the bridge does not cross over a waterway as indicated in Item B.F.01 (Feature Type)

B.AP.04 Scour Plan of Action

U.S. Department of Transportation
Federal Highway Administration

- The NBIS requires a scour POA for bridges over water that are determined to be scour critical or have unknown foundations
  - More information on scour POA can be found at the FHWA Hydraulics Engineering website: http://www.fhwa.dot.gov/engineering/hydraulics/bridgehyd/poa.cfm
- A scour POA is a document that addresses, based on risk, a schedule for repair or installation of scour countermeasures, and/or the monitoring, inspection, closing, and opening a bridge to traffic during and after flood events to protect the traveling public

B.AP.04 Scour Plan of Action

U.S. Department of Transportation
Federal Highway Administration

- A scour POA is implemented when those responsible for actions under the plan are aware of their responsibilities, and are exercising them when called for during or after a triggering event
- A bridge should have a scour POA when it could become unstable for scour, and temporary countermeasures are installed that were not designed

B.AP.05 Seismic Vulnerability

U.S. Department of Transportation
Federal Highway Administration

- Format AN (1), Frequency I
- Report the seismic vulnerability of the bridge using one of the following codes
  - 0 Seismic evaluation not completed
  - N Bridge does not require seismic evaluation due to low anticipated ground motion or agency prioritization
  - A Seismic evaluation completed. Bridge determined to meet the agency's performance criteria established for the evaluation without need for retrofit
    - Use when bridge is designed to meet applicable performance criteria established by the design specifications in effect at the time of construction and bridge would be expected to meet current agency established performance criteria

B.AP.05 Seismic Vulnerability

U.S. Department of Transportation
Federal Highway Administration

- Format AN (1), Frequency I
- Report the seismic vulnerability of the bridge using one of the following codes
  - B Seismic evaluation completed. Satisfactory performance is dependent upon a designed, installed, and functioning retrofit. Retrofit is in place
  - C Seismic evaluation completed. Satisfactory performance is dependent upon a designed, installed, and functioning retrofit. Partial retrofit is in place
    - Use when only certain portions of the bridge have been retrofitted but not all portions of the bridge have been retrofitted to meet agency performance criteria
  - D Seismic evaluation completed. Satisfactory performance is dependent upon a designed, installed, and functioning retrofit. Retrofit is not in place

B.AP.05 Seismic Vulnerability

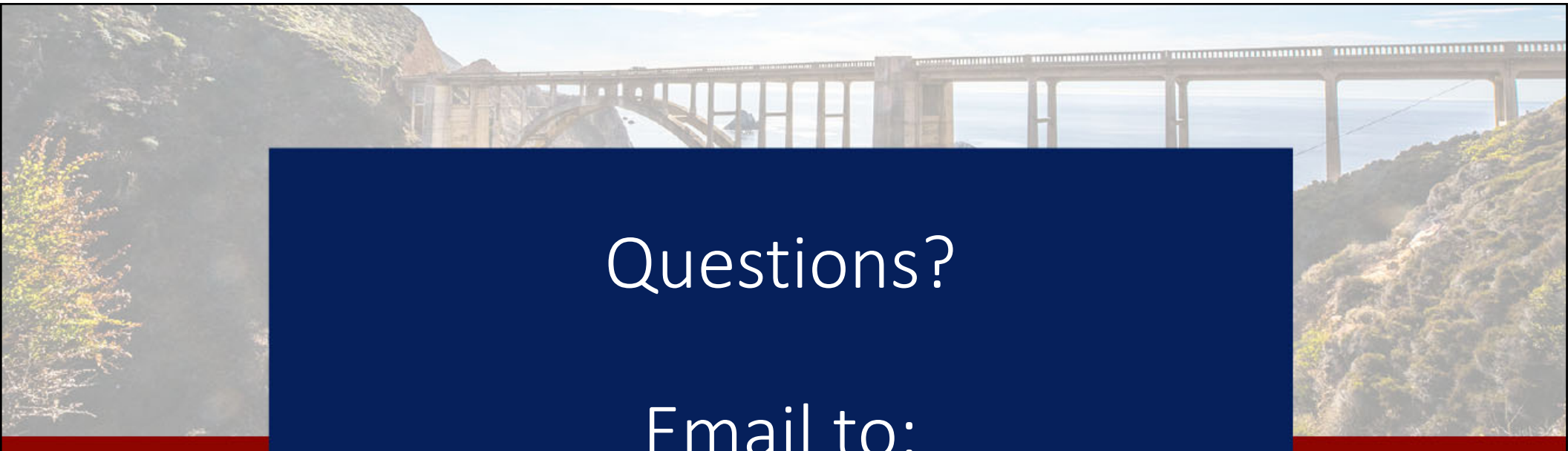
U.S. Department of Transportation
Federal Highway Administration

- This item provides available information resulting from seismic evaluation and retrofit programs that an agency may have performed of their own volition
- The codes allow for a broad interpretation based on the reporting agency's methods and evaluation criteria
- In lieu of agency-developed evaluation criteria
  - Refer to the FHWA Seismic Retrofitting Manual for Highway Structures: Part 1 – Bridges, Publication No. FHWA-HRT-06-032, January 2006, for guidance on assessing the vulnerability of highway structures to the effects of earthquakes, and implementing retrofit measures to improve performance

7.5 - Work Events

- B.W.01 Year Built
- B.W.02 Year Work Performed (many-to-one)
- B.W.03 Work Performed

These items are not considered “new” but reported data is different.



Questions?

Email to:
NBIS_SNBI_Questions@dot.gov

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Federal Highway Administration