U.S. Department of Transportation

Federal Highway Administration

Specifications for the National Bridge Inventory

Office of Bridges and Structures

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Cover photo (Source: Oregon DOT)

FOREWORD

The Specifications for the National Bridge Inventory (SNBI) were developed in coordination with the National Bridge Inspection Standards (NBIS) regulation (23 CFR 650, Subpart C), the AASHTO Manual for Bridge Evaluation (MBE), the AASHTO Manual for Bridge Element Inspection (MBEI), and the FHWA Bridge Inspector's Reference Manual (BIRM). The SNBI is incorporated by reference in the NBIS regulation and provides the specifications for reporting data for highway bridges, open to the public, to the Federal Highway Administration (FHWA) for inclusion in the National Bridge Inventory (NBI).

Element-level data for National Highway System (NHS) bridges, as required by Title 23 U.S.C. §144, have been reported to FHWA since April 2015. The 2014 FHWA Specification for the National Bridge Inventory Bridge Elements (SNBIBE) addressed the reporting of element-level data to FHWA. The SNBIBE has been merged with the SNBI to be inclusive of bridge data reported to FHWA for inclusion in the NBI.

Data in the NBI 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); and providing quality data through clarity and ease of use.

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SI* (MODERN METRIC) CONVERSION FACTORS				
APPROXIMATE CONVERSIONS TO SI UNITS				
Symbol	**When You Know**	**Multiply By**	**To Find**	**Symbol**
		LENGTH		
in	inches	25.4	millimeters	mm
ft	feet	0.305	meters	m
yd	yards	0.914	meters	m
mi	miles	1.61	kilometers	km
		AREA		
in^2	square inches	645.2	square millimeters	mm^2
ft^2	square feet	0.093	square meters	m^2
yd^2	square yard	0.836	square meters	m^2
ac	acres	0.405	hectares	ha
mi^2	square miles	2.59	square kilometers	km^2
		VOLUME		
fl oz	fluid ounces	29.57	milliliters	mL
gal	gallons	3.785	liters	L
ft^3	cubic feet	0.028	cubic meters	m^3
yd^3	cubic yards	0.765	cubic meters	m^3
		NOTE: volumes greater than 1000 L shall be shown in m^3		
		MASS		
oz	ounces	28.35	grams	g
lb	pounds	0.454	kilograms	kg
T	short tons (2000 lb)	0.907	megagrams (or "metric ton")	Mg (or "t")
		TEMPERATURE (exact degrees)		
°F	Fahrenheit	5 (F-32)/9 or (F-32)/1.8	Celsius	°C
		ILLUMINATION		
fc	foot-candles	10.76	lux	lx
fl	foot-Lamberts	3.426	candela/m^2	cd/m^2
		FORCE and PRESSURE or STRESS		
lbf	poundforce	4.45	newtons	N
lbf/in^2	poundforce per square inch	6.89	kilopascals	kPa

*SI is the symbol for the International System of Units. Appropriate rounding should be made to comply with Section 4 of ASTM E380.

SI* (MODERN METRIC) CONVERSION FACTORS				
APPROXIMATE CONVERSIONS FROM SI UNITS				
Symbol	**When You Know**	**Multiply By**	**To Find**	**Symbol**
LENGTH				
mm	millimeters	0.039	inches	in
m	meters	3.28	feet	ft
m	meters	1.09	yards	yd
km	kilometers	0.621	miles	mi
AREA				
mm^2	square millimeters	0.0016	square inches	in^2
m^2	square meters	10.764	square feet	ft^2
m^2	square meters	1.195	square yards	yd^2
ha	hectares	2.47	acres	ac
km^2	square kilometers	0.386	square miles	mi^2
VOLUME				
mL	milliliters	0.034	fluid ounces	fl oz
L	liters	0.264	gallons	gal
m^3	cubic meters	35.314	cubic feet	ft^3
m^3	cubic meters	1.307	cubic yards	yd^3
MASS				
g	grams	0.035	ounces	oz
kg	kilograms	2.202	pounds	lb
Mg (or "t")	megagrams (or "metric ton")	1.103	short tons (2000 lb)	T
TEMPERATURE (exact degrees)				
^oC	Celsius	1.8C+32	Fahrenheit	^oF
ILLUMINATION				
lx	lux	0.0929	foot-candles	fc
cd/m^2	candela/m^2	0.2919	foot-Lamberts	fl
FORCE and PRESSURE or STRESS				
N	newtons	0.225	poundforce	lbf
kPa	kilopascals	0.145	poundforce per square inch	lbf/in^2

*SI is the symbol for the International System of Units. Appropriate rounding should be made to comply with Section 4 of ASTM E380.

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INTRODUCTION

Bridge inventory information collected by each State transportation department, Federal agency and Tribal government is reported to the Federal Highway Administration (FHWA), as requested, in accordance with the National Bridge Inspection Standards (NBIS) reporting requirements (23 CFR 650.315). The resulting information is maintained in the National Bridge Inventory (NBI) database, which enables state-level and national-level analyses and reporting, supports Federal funding programs, and facilitates the identification of freight and defense-critical corridors and connectors. By having a complete and thorough inventory, an accurate report can be made to the Congress on the number, condition, and performance of the Nation's bridges. The data also support FHWA's programs, and the efforts of the Military Surface Deployment and Distribution Command (SDDC) Transportation Engineering Agency (TEA).

The Manual for Bridge Evaluation (MBE), produced by the American Association of State Highway and Transportation Officials (AASHTO), discusses the various items of information that are to be recorded as part of bridge inspections. That manual and the FHWA's Bridge Inspector's Reference Manual (BIRM) discuss inspection procedures and the preparation of detailed reports about bridge members. These reports are the basis for reporting values for many of the data items shown in these specifications.

The proper assessment of element-level 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. These specifications include the description of bridge condition rating data for both component-level (deck, superstructure, substructure, and culvert) and element-level evaluation.

The reporting of inventory data for all highway bridges subject to the NBIS, and their related features, are based on the definitions, explanations, and data items supplied in these specifications and supplemented by the NBIS, AASHTO Manual for Bridge Element Inspection (MBEI), MBE, and BIRM. State transportation departments, Federal agencies, and Tribal governments use the data items and instructions in these specifications when reporting NBI data to FHWA. These agencies are responsible for the accuracy and completeness of the reported data, using agency data quality control and quality assurance procedures. Agencies may use their own data item names and codes for their agency inventory, but must report NBI data to FHWA in accordance with these specifications.

It is expected that coordination is needed between various personnel, in various infrastructure disciplines of an agency, to obtain and report the data in accordance with these specifications, and does not solely rely on bridge inspection personnel.

All possible combinations of actual bridge characteristics may not be addressed in these specifications. Consult with the local FHWA division office contact for an acceptable solution when a special situation is encountered that is not addressed by these specifications.

The data items in these specifications have been grouped into sections and subsections with like characteristics. The following is a list of sections and subsections in the order that they are presented within these specifications.

- Section 1: Bridge Identification
  - Subsection 1.1: Identification
  - Subsection 1.2: Location
  - Subsection 1.3: Classification
- Section 2: Bridge Material and Type
  - Subsection 2.1: Span Material and Type
  - Subsection 2.2: Substructure Material and Type
  - Subsection 2.3: Roadside Hardware
- Section 3: Bridge Geometry
- Section 4: Features
  - Subsection 4.1: Feature Identification
  - Subsection 4.2: Routes
  - Subsection 4.3: Highways
  - Subsection 4.4: Railroads
  - Subsection 4.5: Navigable Waterways
- Section 5: Loads, Load Rating, and Posting
  - Subsection 5.1: Loads and Load Rating
  - Subsection 5.2: Load Posting Status
  - Subsection 5.3: Load Evaluation and Posting
- Section 6: Inspections
  - Subsection 6.1: Inspection Requirements
  - Subsection 6.2: Inspection Events
- Section 7: Bridge Condition
  - 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

In most subsections, each data item has a single value associated with the reported bridge record. These items are referred to as having a "one-to-one" relationship with the bridge. 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.

In some cases, multiple values may apply, but are still reported in a single instance. For these items, shown below, multiple values are delimited by the pipe character (|). No additional spaces should be used in conjunction with the pipe character.

- Item B.ID.02 *(Bridge Name)* – A bridge may be known by several names. This item is part of the Identification subsection.

- Item B.L.12 *(Metropolitan Planning Organization)* – A bridge may be located on a boundary between multiple MPOs. This item is part of the Location subsection.

- Item B.CL.03 *(Federal or Tribal Land Access)* – A bridge may be located on a highway that is owned by a State or local agency and leads to or traverses through multiple Federally managed and/or Tribal government lands. This item is part of the Classification subsection.

- Item B.F.03 *(Feature Name)* – A feature may be known by several names. This item is part of the Feature Identification subsection as described below.

- Item B.IE.12 *(Inspection Equipment)* – Some bridges require multiple types of equipment for inspection access and/or specialized inspections. This item is part of the Inspection Events subsection as described below.

- Item B.W.03 *(Work Performed)* – In a given year, multiple types of work may be completed on a bridge. This item is part of the Work Events subsection as described below.

Other subsections contain data items for which there may be multiple values associated with the reported bridge record; however, each value is reported as a separate instance. These items are characterized as having a "many-to-one" relationship with the bridge. These data items fall into two categories, as discussed below.

The first many-to-one category includes data items where multiple events may occur in a reporting period. Each event is reported as a separate sub-record associated with the bridge record. FHWA maintains an historical record of all events that are reported over the life of a bridge. The subsections that contain items in this category are as follows. Sub-records are referred to below as records.

- Subsection 5.2: Load Posting Status – The posting status of a bridge may change multiple times between data submittals and throughout its service life. For each posting status change event, a record is reported that contains a value for Item B.PS.01 *(Load Posting Status)* and Item B.PS.02 *(Posting Status Change Date)*.

- Subsection 6.2: Inspection Events – A bridge may undergo several inspection events between data submittals, and will undergo many throughout its service life. For each inspection event, a record is reported that contains a value for Item B.IE.01 *(Inspection Type)*, Item B.IE.02 *(Inspection Begin Date)*, and all other applicable items in this subsection. Multiple values may be reported for Item B.E.12 *(Inspection Equipment)*, as described above.

- Subsection 7.5: Work Events – A bridge may have work completed at various times throughout its service life. For each year, a record is reported that contains a value for Item B.W.02 *(Year Work Performed)* and one or multiple values for Item B.W.03 *(Work Performed)*, as described above.

The second many-to-one category includes data items where multiple values may apply to a bridge that are not event-related. The first item in the subsection defines a sub-record for each unique value associated with the reported bridge record; all other related items are reported as part of each sub-record. The subsections that contain items in this category are as follows. Sub-records are referred to below as records.

- Subsection 2.1: Span Material and Type – All unique span configurations are identified in Item B.SP.01 *(Span Configuration Designation)*. This item has multiple records for a bridge only if there are multiple span configurations. All other items in this subsection are reported for each span configuration record, if they apply to that record.

- Subsection 2.2: Substructure Material and Type - All unique substructure configurations are identified in Item B.SB.01 *(Substructure Configuration Designation)*. This item has multiple records for a bridge only if there are multiple substructure configurations. All other items in this subsection are reported for each substructure configuration record, if they apply to that record.

- Subsection 4.1: Feature Identification – Features that are carried on, or pass above or below a bridge, are identified in Item B.F.01 *(Feature Type)*. This item always has multiple records for each bridge because there must be at least one feature carried on the bridge and at least one below the bridge. The other items in Section 4 (Features) are reported for each feature record, if they apply to that record. Most items apply only to specific feature types.

- Subsection 4.2: Routes – Each highway feature identified in Item B.F.01 *(Feature Type)* has at least one associated route record. A highway feature has multiple route records only if multiple routes with route numbers share the highway feature. All unique routes are identified in Item B.RT.01 *(Route Designation)*. The items in this subsection are reported for each route record.

- Subsection 4.3: Highways – The items in this subsection are reported for each highway feature reported in Item B.F.01 *(Feature Type)*.

- Subsection 4.4: Railroads – The items in this subsection are reported for each railroad feature reported in Item B.F.01 *(Feature Type)*.

- Subsection 4.5: Navigable Waterways – The items in this subsection are reported for each waterway feature reported in Item B.F.01 *(Feature Type)*. If the waterway is not a navigable waterway, only Item B.N.01 *(Navigable Waterway)* is reported.

- Subsection 5.3: Load Evaluation and Posting – When a bridge has undergone a posting analysis, all AASHTO legal load configurations that were evaluated for the bridge are identified in Item B.EP.01 *(Legal Load Configuration)*. This item has multiple records for a bridge only if multiple legal load configurations were evaluated. All other items in this subsection are reported for each legal load configuration record, if they apply to that record.

- Subsection 7.2: Element Identification and Subsection 7.3: Element Conditions – All elements that are associated with a bridge are identified in Item B.E.01 *(Element Number)*. This item has multiple records for most bridges. All other items in these two subsections are reported for each element record; Item B.E.02 *(Element Parent Number)* is reported only if it applies to that element record.

10 - ROUTES
State Code
Bridge Number
Feature Type
Route Designation
Route Number
Route Direction
Route Type
Service Type

2 - FEATURES
State Code
Bridge Number
Feature Type
Feature Location
Feature Name
Functional Classification
Urban Code
NHS Designation
National Highway Freight Network
STRAHNET Designation
LRS Route ID
LRS Mile Point
Lanes on Highway
Annual Average Daily Traffic
Annual Average Daily Truck Traffic
Year of Annual Average Daily Traffic
Highway Maximum Usable Vertical Clearance
Highway Minimum Vertical Clearance
Highway Minimum Horizontal Clearance, Left
Highway Minimum Horizontal Clearance, Right
Highway Maximum Usable Surface Width
Bypass Detour Length
Crossing Bridge Number
Railroad Service Type
Railroad Minimum Vertical Clearance
Railroad Minimum Horizontal Offset
Navigable Waterway
Navigation Minimum Vertical Clearance
Movable Bridge Maximum Navigation Vertical Clearance
Navigation Channel Width
Navigation Channel Minimum Horizontal Clearance
Substructure Navigation Protection

3 - SPAN SETS
State Code
Bridge Number
Span Configuration Designation
Number of Spans
Number of Beam Lines
Span Material
Span Continuity
Span Type
Span Protective System
Deck Interaction
Deck Material and Type
Wearing Surface
Deck Protective System
Deck Reinforcing Protective System
Deck Stay-in-Place Forms

4 - SUBSTRUCTURE SETS
State Code
Bridge Number
Substructure Configuration Designation
Number of Substructure Units
Substructure Material
Substructure Type
Substructure Protective System
Foundation Type
Foundation Protective System

Key: Unique table record identifier items

1 - PRIMARY
State Code
Bridge Number
Bridge Name
Previous Bridge Number
County Code
Place Code
Highway Agency District
Latitude
Longitude
Border Bridge Number
Border Bridge State or Country Code
Border Bridge Inspection Responsibility
Border Bridge Designated Lead State
Bridge Location
Metropolitan Planning Organization
Owner
Maintenance Responsibility
Federal or Tribal Land Access
Historic Significance
Toll
Emergency Evacuation Designation
Bridge Railings
Transitions
NBIS Bridge Length
Total Bridge Length
Maximum Span Length
Minimum Span Length
Bridge Width Out-to-Out
Bridge Width Curb-to-Curb
Left Curb or Sidewalk Width
Right Curb or Sidewalk Width
Approach Roadway Width
Bridge Median
Skew
Curved Bridge
Maximum Bridge Height
Sidehill Bridge
Irregular Deck Area
Calculated Deck Area
Design Load
Design Method
Load Rating Date
Load Rating Method
Inventory Load Rating Factor
Operating Load Rating Factor
Controlling Legal Load Rating Factor
Routine Permit Loads
NSTM Inspection Required
Fatigue Details
Underwater Inspection Required
Complex Feature
Deck Condition Rating
Superstructure Condition Rating
Substructure Condition Rating
Culvert Condition Rating
Bridge Railing Condition Rating
Bridge Railing Transitions Condition Rating
Bridge Bearings Condition Rating
Bridge Joints Condition Rating
Channel Condition Rating
Channel Protection Condition Rating
Scour Condition Rating
Bridge Condition Classification
Lowest Condition Rating Code
NSTM Inspection Condition
Underwater Inspection Condition
Approach Roadway Alignment
Overtopping Likelihood
Scour Vulnerability
Scour Plan of Action
Seismic Vulnerability
Year Built

5 - POSTING STATUS
State Code
Bridge Number
Posting Status Change Date
Load Posting Status

6 - POSTING EVALUATION
State Code
Bridge Number
Legal Load Configuration
Legal Load Rating Factor
Posting Type
Posting Value

7 - INSPECTIONS
State Code
Bridge Number
Inspection Type
Inspection Begin Date
Inspection Completion Date
Nationally Certified Bridge Inspector
Inspection Interval
Inspection Due Date
Risk-Based Inspection Interval Method
Inspection Quality Control Date
Inspection Quality Assurance Date
Inspection Data Update Date
Inspection Note
Inspection Equipment

8 - ELEMENTS
State Code
Bridge Number
Element Number
Element Parent Number
Element Total Quantity
Element Quantity Condition State One
Element Quantity Condition State Two
Element Quantity Condition State Three
Element Quantity Condition State Four

9 - WORK
State Code
Bridge Number
Year Work Performed
Work Performed

Figure 1. SNBI data relationships.

ABBREVIATIONS, ACRONYMS, AND SYMBOLS

AADT	Annual average daily traffic
AADTT	Annual average daily truck traffic
AASHTO	American Association of State Highway and Transportation Officials
AGC	Associated General Contractors of America
AN	Alpha numeric
ARS	Agricultural Research Service (United States Department of Agriculture)
ARTBA	American Road and Transportation Builders Association
BIRM	Bridge Inspector's Reference Manual
C	Calculated
CFR	Code of Federal Regulations
CIP	Cast-in-place
CL	Center line
CA	Canada
CS	Condition state
D	Date
DC	District of Columbia
DOD	Department of Defense
DOT	Department of Transportation
E	East
EA	Each
EI	Each inspection
EN	Element number
EPN	Element parent number
FHWA	Federal Highway Administration
FIPS	Federal Information Processing Series
FL	Florida
FRP	Fiber reinforced polymer
ft	Foot or feet
ft^2	Square foot or square feet
Glulam	Glued laminated timber
GRS	Geosynthetic reinforced soil
HDPE	High density polyethylene
HEC	Hydraulic Engineering Circular
HPMS	Highway Performance Monitoring System
Hwy	Highway
I	Initial or Interstate
ID	Identification
in	Inch or inches
LF	Linear feet
LRFD	Load and Resistance Factor Design
LRFR	Load and Resistance Factor Rating
LRS	Linear Referencing System
MASH	Manual for Assessing Safety Hardware (AASHTO)
MBE	Manual for Bridge Evaluation (AASHTO)
MBEI	Manual for Bridge Element Inspection (AASHTO)
MHHW	Mean high-high water
MHW	Mean high water
MLW	Mean low water
MoDOT	Missouri Department of Transportation
MPO	Metropolitan Planning Organization
MSE	Mechanically stabilized earth

MUTCD	Manual on Uniform Traffic Control Devices
MX	Mexico
N	Numeric or North
NA	Not applicable
NASA	National Aeronautics and Space Administration
NBI	National Bridge Inventory
NBIS	National Bridge Inspection Standards, 23CFR650C
NCHRP	National Cooperative Highway Research Program
NDE	Non-destructive evaluation
NE	Nebraska
NHFN	National Highway Freight Network
NHS	National Highway System
NSTM	Nonredundant steel tension member
PE	Polyethylene
POA	Plan of action
PSC	Prestressed concrete
PUB	Publication
QA	Quality Assurance
QC	Quality Control
QTY	Quantity
RC	Reinforced concrete
RF	Rating Factor
SCUBA	Self-contained underwater breathing apparatus
SDDC	Military Surface Deployment and Distribution Command
SF	Square foot or square feet
SHPO	State Historic Preservation Office or Officer
S	South
SN	Structure number
SNBI	Specifications for the National Bridge Inventory
SR	State route
STIP	Statewide Transportation Improvement Program
STRAHNET	Strategic highway network
U.S.	United States
U.S.C.	United States Code
W	West

DEFINITIONS

AASHTO Manual: The term "AASHTO Manual" means the American Association of State Highway and Transportation Officials (AASHTO) "Manual for Bridge Evaluation" with Sections 1.4, 2.2, 4.2, 6, and 8, excluding the 3rd paragraph in Article 6B.7.1. (23 CFR 650.317(a)(1))

AASHTO MBEI: AASHTO Manual for Bridge Element Inspection is a reference for standardized element definitions, element quantity calculations, condition state definitions, element feasible actions, and inspection conventions. This manual is used for element descriptions, quantity calculations, and condition state definitions. (23 CFR 650.317(a)(2))

Annual Average Daily Traffic (AADT): The total annual volume of traffic passing a point or segment of a highway in both directions divided by the number of days in a year.

Annual Average Daily Truck Traffic (AADTT): The total annual volume of truck traffic passing a point or segment of a highway in both directions divided by the number of days in a year.

Bridge: A structure including supports erected over a depression or an obstruction, such as water, highway, or railway, and having a track or passageway for carrying traffic or other moving loads, and having an opening measured along the center of the roadway of more than 20 feet between under copings of abutments or spring lines of arches, or extreme ends of openings for multiple boxes; it includes multiple pipes, where the clear distance between openings is less than half of the smaller contiguous opening. (23 CFR 650.305)

Bridge Elements: Individual parts of a bridge that are subsets of bridge components, inventoried separately as functional groups. Elements inventoried on the bridge include: the total quantity for each element, and the element quantity that exists in each of four condition states reported to the NBI in accordance with 23 U.S.C. 144(d)(2).

Bridge Inspector's Reference Manual: A comprehensive FHWA manual on procedures and techniques for inspecting and evaluating a variety of in-service highway bridges. This manual is available at: https://www.fhwa.dot.gov/bridge/nbis.cfm. (23 CFR 650.305)

Closed Median: A median in which the area between the two roadways on the structure is bridged over and is capable of supporting traffic.

Complex Feature: Bridge component(s) or member(s) with advanced or unique structural members or operational characteristics, construction methods, and/or requiring specific inspection procedures. This includes mechanical and electrical elements of movable spans and cable-related members of suspension and cable-stayed superstructures. (23 CFR 650.305)

Culvert: A structure comprised of one or more barrels, beneath an embankment and designed structurally to account for soil-structure interaction. These structures are hydraulically and structurally designed to convey water, sediment, debris, and, in many cases, aquatic and terrestrial organisms through roadway embankments. Culvert barrels have many sizes and shapes and have inverts that are either integral or open, i.e. supported by spread or pile-supported footings. Many culverts take advantage of headwater submergence of the inlet to increase hydraulic efficiency and economy.

Damage Inspection: An unscheduled inspection to assess structural damage resulting from environmental factors or human actions. (23 CFR 650.305)

Designated Lead State: The State responsible for reporting the full bridge record for a border bridge. The Designated Lead State and Neighboring State are determined through agreement between the two border States.

Divided Highway: A highway with separated roadways for traffic traveling in opposite directions.

Double Deck Bridge: A bridge consisting of two decks, tiers, or levels. These bridges may incorporate highway lanes on both levels or highway lanes on one level and other transportation modes on the other level.

Driver Expectation: Relates to the likelihood that a driver will respond to common situations in predictable ways that the driver has found successful in the past. A driver's readiness to respond to situations, events, and information in predictable and successful ways.

Efflorescence: A deposit on concrete, brick, stone, or mortar caused by crystallization of carbonates brought to the surface by moisture in the masonry or concrete. Efflorescence is a combination of calcium carbonate leached out of the cement paste and other recrystallized carbonate and chloride compounds.

Element Level Bridge Inspection Data: Quantitative condition assessment data, collected during bridge inspections, that indicates the severity and extent of defects in bridge elements. (23 CFR 650.305)

Engineered Wood: Products that utilize veneers, plywood, reconstituted wood panel products, or engineered wood assemblies. Some engineered wood products include glued laminated timber, I-joists, and laminated veneer lumber.

Federal Information Processing Series (FIPS): A system of numeric and/or alphabetic coding issued by the National Institute of Standards and Technology (NIST), an agency of the US Department of Commerce. FIPS codes are assigned for a variety of geographic entities including American Indian and Alaska Native Areas, Hawaiian home lands, congressional districts, counties, county subdivisions, metropolitan areas, places, and states. FIPS codes were discontinued by NIST in 2005, but the Census Bureau continues to maintain and issue codes for the geographic entities covered. (*http://www.fhwa.dot.gov/bridge/nbi.cfm*)

Federal Lands: Lands under the jurisdiction of Federal agencies. FHWA's Federal Land Management Agency partners currently include: National Park Service (NPS); USDA Forest Service (Forest Service); U.S. Fish and Wildlife Service (USFWS); Bureau of Indian Affairs (BIA) and Tribal Governments; Bureau of Land Management (BLM); Department of Defense (DOD); U.S. Army Corps of Engineers (USACE); and Bureau of Reclamation (BOR). (*https://highways.dot.gov/federal-lands/about*)

Ferry Transfer Bridge: A bridging structure that enables vehicular movement from a dock or approach roadway to a ferry.

Fiber Reinforced Polymer Composite: Fiber reinforced polymer composite (FRP) is also known as fiberglass reinforced plastic and is a composite made from glass fiber or carbon fiber reinforcement in a plastic (polymer) matrix. With reinforcement of the plastic matrix, a wide variety of physical strengths and properties can be designed into the material. Additionally, the type and configuration of the reinforcement can be selected, along with the type of polymer and additives within the matrix.

Floating Bridge: A bridge supported by floating on pontoons moored to the lakebed or riverbed; a portion may be removable to facilitate navigation.

Hands-on Inspection: Inspection within arm's length of the member. Inspection uses visual techniques that may be supplemented by nondestructive evaluation techniques. (23 CFR 650.305)

Highway: The term "highway" includes: A) a road, street, and parkway; B) a right-of-way, bridge, railroad-highway crossing, tunnel, drainage structure, sign, guardrail, and protective structure, in connection with a highway; and C) 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. (23 U.S.C. 101(a))

Highway Performance Monitoring System: A national level highway information system that includes data on the extent, condition, performance, use, and operating characteristics of the nation's highways. (HPMS Field Manual: *http://www.fhwa.dot.gov/policyinformation/hpms/fieldmanual/*)

Hydraulic review: A review by a person qualified to evaluate the field-observed hydraulic conditions and make a determination of the impacts of the conditions on the performance of the channel, channel protection, or when working with structural staff, determine the scour vulnerability of a bridge member or entire bridge. Hydraulic reviews may include a review of the field inspection notes and photographs, review of as-built plans, scour appraisals, and scour POAs, or performance of a hydraulic analysis as deemed appropriate.

In-Depth Inspection: A close-up, detailed inspection of one or more bridge members located above or below water, using visual or nondestructive evaluation techniques as required to identify any deficiencies not readily detectable using routine inspection procedures. Hands-on inspection may be necessary at some locations. In-depth inspections may occur more or less frequently than routine inspections, as outlined in bridge specific inspection procedures. (23 CFR 650.305)

Initial Inspection: The first inspection of a new, replaced, or rehabilitated bridge. This inspection serves to record required bridge inventory data, establish baseline conditions, and establish the intervals for other inspection types. (23 CFR 650.305)

Inspection Date: The date on which the field portion of the bridge inspection is completed. (23 CFR 650.305)

Inspection Due Date: The last inspection date plus the current inspection interval. (23 CFR 650.305)

Inspection Report: The document which summarizes the bridge inspection findings, recommendations, and identifies the team leader responsible for the inspection and report. (23 CFR 650.305)

Internal Redundancy: A redundancy that exists within a primary member cross-section without load path redundancy, such that fracture of one component will not propagate through the entire member, is discoverable by the applicable inspection procedures, and will not cause a portion of or the entire bridge to collapse. (23 CFR 650.305)

Inventory Data: All data reported to the National Bridge Inventory in accordance with the Specifications for the National Bridge Inventory. (23 CFR 650.317(b)(1)).

Legal Load: The maximum load for each vehicle configuration, including the weight of the vehicle and its payload, permitted by law for the State in which the bridge is located. (23 CFR 650.305)

Legal Load Rating: The maximum permissible legal load to which the structure may be subjected with the unlimited numbers of passages over the duration of a specified bridge evaluation period. Legal load rating is a term used in Load and Resistance Factor Rating method. (23 CFR 650.305)

Load Path Redundancy: A redundancy that exists based on the number of primary load-carrying members between points of support, such that fracture of the cross section at one location of a member will not cause a portion of or the entire bridge to collapse. Load posting. Regulatory signs installed in accordance with the "Manual on Uniform Traffic Control Devices" and State or local law which represent the maximum vehicular live load which the bridge may safely carry. (23 CFR 650.305)

Legally Enforceable Load Posting: Posting of a load restriction sign (or signs) at a bridge in accordance with State law that is legally enforceable by law enforcement personnel.

Linear Referencing System: Provides a geospatial representation of a road network through a set of procedures for determining and retaining a record of specific points along a highway. Typical methods used are mile point, milepost, reference point, or link node. LRS data are required for the annual Highway Performance Monitoring System (HPMS) data submittal from the States to FHWA.

Load Posting: Regulatory signs installed in accordance with the "Manual on Uniform Traffic Control Devices" and State or local law which represent the maximum vehicular live load which the bridge may safely carry. (23 CFR 650.305)

Load Rating: The analysis to determine the safe vehicular live load carrying capacity of a bridge using bridge plans and supplemented by measurements and other information gathered from an inspection. (23 CFR 650.305)

Major Rehabilitation: The major work required to restore the structural integrity or serviceability of a bridge as well as work necessary to correct major safety defects.

Median: The portion of a highway separating opposing directions of the traveled way.

Minor Rehabilitation: The minor work required to preserve or restore the structural integrity of a bridge or serviceability as well as the work necessary to correct minor safety defects.

Multi-level Interchange: A multilevel highway intersection or junction of intersecting roads and bridges arranged so that vehicles may move from one road to another without crossing the streams of traffic.

National Bridge Inspection Standards: Federal regulations establishing national policy regarding bridge inspection organization, bridge inspection frequency, inspector qualifications, inventory requirements, report formats, and inspection and rating procedures, as described in 23 CFR 650 Subpart C.

National Bridge Inventory: An aggregation of State transportation department, Federal agency and Tribal government bridge and associated highway data maintained by the Federal Highway Administration (FHWA). The NBIS requires each State transportation department, Federal agency, and Tribal government to prepare and maintain a bridge inventory, which must be submitted to FHWA in accordance with these specifications on an annual basis or whenever requested. (23 CFR 650.315)

National Highway Freight Network: A national highway freight network established by FHWA to assist States in strategically directing resources toward improved movement of freight on highways. The National Highway Freight Network consists of a Primary Highway Freight System, the portions of the Interstate System not designated as part of the Primary Highway Freight System, and Critical Rural Freight Corridors and Critical Urban Freight Corridors designated by states. (http://www.ops.fhwa.dot.gov/freight/infrastructure/nfn/index.htm)

Nationally Certified Bridge Inspector: An individual meeting the team leader requirements of 23 CFR 650.309(b).

Navigable Waterway: Navigable waterways are determined by the Commandant of the United States Coast Guard. Title 33 of the Code of Federal Regulations, Section 2.36, defines navigable waterways as consisting of:

1. Territorial seas of the United States;
2. Internal waters of the United States that are subject to tidal influence; and
3. Internal waters of the United States not subject to tidal influence that:
   a. Are or have been used, or are or have been susceptible for use, by themselves or in connection with other waters, as highways for substantial interstate or foreign commerce, notwithstanding natural or man-made obstructions that require portage, or
   b. A governmental or non-governmental body, having expertise in waterway improvement, determines to be capable of improvement at a reasonable cost (a favorable balance between cost and need) to provide, by themselves or in connection with other waters, highways for substantial interstate or foreign commerce.

Neighboring State: The State responsible for reporting an abbreviated bridge record for a border bridge. The Designated Lead State and the Neighboring State are determined through agreement between the two border States.

Nonredundant Steel Tension Member (NSTM): A primary steel member fully or partially in tension, and without load path redundancy, system redundancy, or internal redundancy, whose failure may cause a portion of or the entire bridge to collapse. (23 CFR 650.305)

Nonredundant Steel Tension Member (NSTM) Inspection: A hands-on inspection of a nonredundant steel tension member. (23 CFR 650.305)

Operating Rating:	The maximum permissible live load to which the structure may be subjected for the load configuration used in the load rating. Allowing unlimited numbers of vehicles to use the bridge at operating level may shorten the life of the bridge. Operating rating is a term used in either Allowable Stress or Load Factor Rating method. (23 CFR 650.305)
Orthotropic Deck:	An orthotropic deck consists of a flat, thin steel plate stiffened by a series of closely spaced longitudinal ribs at right angles to the floor beams. The deck acts integrally with the steel superstructure.
Private Bridge:	A bridge open to public travel and not owned by a public authority as defined in 23 U.S.C. 101. (23 CFR 650.305)
Procedures:	Written documentation of policies, methods, considerations, criteria, and other conditions that direct the actions of personnel so that a desired end result is achieved consistently. (23 CFR 650.305)
Probability:	Extent to which an event is likely to occur during a given interval. This may be based on the frequency of events, such as in the quantitative probability of failure, or on degree of belief or expectation. Degrees of belief about probability can be chosen using qualitative scales, ranks, or categories such as, remote, low, moderate, or high. (23 CFR 650.305)
Program Manager:	The individual in charge of the program, that has been assigned the duties and responsibilities for bridge inspection, reporting, and inventory, and has the overall responsibility to ensure the program conforms with the requirements of the NBIS as provided in 23 CFR 650 Subpart C. The program manager provides overall leadership and is available to inspection team leaders to provide guidance. (23 CFR 650.305)
Public Road:	As defined in 23 U.S.C. 101(a)(21) as any road or street under the jurisdiction of and maintained by a public authority and open to public travel. (23 CFR 650.305).
Quality Assurance (QA):	The use of sampling and other measures to assure the adequacy of quality control procedures in order to verify or measure the quality level of the entire bridge inspection and load rating program. (23 CFR 650.305)
Quality Control (QC):	Procedures that are intended to maintain the quality of a bridge inspection and load rating at or above a specified level. (23 CFR 650.305)
Railroad Flat Car:	A salvaged flatbed railroad car used as a bridge superstructure, typically on low-volume roads. This type of bridge often has NSTMs.
Replacement:	Total replacement of a bridge with a new facility constructed in the same general traffic corridor.

Risk:	The exposure to the possibility of structural safety or serviceability loss during the interval between inspections. It is the combination of the probability of an event and its consequence. (23 CFR 650.305)
Roadway:	The portion of a highway, including shoulders, for vehicular use. A divided highway has two or more roadways.
Route:	A specific road, highway, or travel way open to public travel.
Routine Inspection:	Regularly scheduled comprehensive inspection consisting of observations and measurements needed to determine the physical and functional condition of the bridge and identify changes from previously recorded conditions. (23 CFR 650.305)
Routine Permit Load:	A live load, which has a gross weight, axle weight, or distance between axles not conforming with State statutes for legally configured vehicles, authorized for unlimited trips over an extended period of time to move alongside other heavy vehicles on a regular basis. (23 CFR 650.305)
Safe Load Capacity:	A live load that can safely utilize a bridge repeatedly over the duration of a specified inspection interval. (23 CFR 650.305)
Scour:	Erosion of streambed or bank material due to flowing water; often considered as being localized around piers and abutments of bridges. (23 CFR 650.305)
Scour Appraisal:	A risk-based and data-driven determination of a bridge's vulnerability to scour, resulting from the least stable result of scour that is either observed, or estimated through a scour evaluation or a scour assessment. (23 CFR 650.305)
Scour Assessment:	The determination of an existing bridge's vulnerability to scour which considers stream stability and scour potential as described in HEC 20 and other scour-related data sources. (23 CFR 650.305)
Scour Critical Bridge:	A bridge with a foundation member that is unstable, or may become unstable, as determined by the scour appraisal. (23 CFR 650.305)
Scour Evaluation:	The application of hydraulic analysis as described in HEC 18 and HEC 20 to estimate scour depths and determine bridge and substructure stability considering potential scour. (23 CFR 650.305)
Scour Monitoring Inspection:	An inspection performed during or after a triggering storm event as required by a Scour Plan of Action (POA), by personnel with qualifications required by the agency.
Scour Plan of Action (POA):	Procedures for bridge inspectors and engineers in managing each bridge determined to be scour critical or that has unknown foundations. (23 CFR 650.305)

Service Inspection: An inspection to identify major deficiencies and safety issues, performed by personnel with general knowledge of bridge maintenance or bridge inspection. (23 CFR 650.305)

Special Inspection: An inspection scheduled at the discretion of the bridge owner, used to monitor a particular known or suspected deficiency, or to monitor special details or unusual characteristics of a bridge that does not necessarily have defects. (23 CFR 650.305)

State: Any of the 50 States, the District of Columbia, or Puerto Rico. (23 U.S.C. 101(a))

State Transportation Department: That department, commission, board, or official of any State charged by its laws with the responsibility for highway construction. (23 U.S.C. 101(a))

Strategic Highway Network (STRAHNET) Connectors: Highways which provide access between major military installations and highways which are part of the Strategic Highway Network.

Strategic Highway Network (STRAHNET): A network of highways which are important to the United States' strategic defense policy and which provide defense access, continuity, and emergency capabilities for defense purposes.

Structural Review: A review by a person qualified to evaluate the field-observed conditions and make a determination of the impacts of the conditions on the performance of the bridge member or entire bridge. Structural reviews may include a review of the field inspection notes and photographs, review of as-built plans, or analysis as deemed appropriate.

Supported Bridge: A bridge with temporary shoring, supports, repairs, or supplemental members that are installed to keep the bridge open despite deficiencies in the permanent structure, pending future repairs or replacement.

System Redundancy: A redundancy that exists in a bridge system without load path redundancy, such that fracture of the cross section at one location of a primary member will not cause a portion of or the entire bridge to collapse. (23 CFR 650.305)

Team Leader: The on-site, nationally certified bridge inspector in charge of an inspection team and responsible for planning, preparing, performing, and reporting on bridge field inspections. (23 CFR 650.305)

Temporary Bridge: A bridge which is constructed to carry highway traffic until the permanent facility is built, repaired, rehabilitated, or replaced. (23 CFR 650.305)

Traveled Way: The portion of roadway for the movement of vehicles, exclusive of shoulders.

Underwater Bridge Inspection Diver: The individual performing the inspection of the underwater portion of the bridge. (23 CFR 650.305)

Underwater Inspection: Inspection of the underwater portion of a bridge substructure and the surrounding channel, which cannot be inspected visually at low water or by wading or probing, and generally requiring diving or other appropriate techniques. (23 CFR 650.305)

Unknown Foundations: Foundations of bridges over waterways where complete details are unknown because either the foundation type and depth are unknown, or the foundation type is known, but its depth is unknown, and therefore cannot be appraised for scour vulnerability. (23 CFR 650.305)

SPECIFICATION FORMAT

These specifications provide information in a format modeled in part after the AASHTO design specifications, with the specification separated and presented parallel to the commentary. The format used to present the data items is as shown in the following table.

Data Item Name		
Format	Frequency	Item ID
Specification		Commentary
Requirements for reporting the data item.		Expanded guidance on the specification.
Specification Continued, Commentary Continued, or Examples		
Additional space for Specification or Commentary, if needed. Examples are presented to further clarify the specification. Each item typically has brief examples. A more comprehensive example can be found at the end of each section or subsection.		

The fields shown in the table above are further described as follows.

Field Name	Description
Format	Designates the format of the data using one of the following: AN (X) – Alphanumeric, where X is the maximum number of characters. Use the pipe character (|) as the text or code delimiter when applicable. Example: Urban Code format is AN (5) – Alphanumeric data, up to 5 characters. Urban Code is 02629. Report 02629. Example: Bridge Name format is AN (300) – Alphanumeric data, up to 300 characters. Bridge Name is Indian River Inlet Bridge. Report Indian River Inlet Bridge. N (X,Y) – Numeric, where X is the maximum number of digits, and Y is the number of decimal places. Example: Bridge Length format is N (7,1) – Numeric data, up to 7 digits including 1 decimal place. Bridge Length is 25.38 ft. Report 25.4. YYYYMMDD – Date, where leading zeroes are required. Example: July 1, 2016. Report 20160701. This information is provided to assist owners when establishing databases and reporting data to FHWA.

Field Name	Description
Frequency	I (Initial) – Data are recorded initially and updated when necessary, but would not typically change from inspection to inspection. Data are recorded or updated by the inspector or other agency personnel. EI (Each Inspection) – Data are verified and/or updated by the inspector during each inspection. C (Calculated) – Data are automatically calculated and stored by FHWA and are not recorded during inspections or reported to FHWA.
Item ID	This is a unique indicator assigned to each bridge item, following this format: B.X.Y, where B indicates that it is a bridge item, X is an alphabetic designation for the section or subsection of the Specifications in which the item appears, and Y is a unique numerical designation indicating the order of appearance for that item within the section or subsection. Section and Subsection designations are as follows: Section 1: Bridge Identification ID – Identification L – Location CL – Classification Section 2: Bridge Material and Type SP – Span Material and Type SB – Substructure Material and Type RH – Roadside Hardware Section 3: Bridge Geometry G – Bridge Geometry Section 4: Features F – Feature Identification RT – Routes H – Highways RR – Railroads N – Navigable Waterways Section 5: Loads, Load Rating, and Posting LR – Loads and Load Rating PS – Load Posting Status EP – Load Evaluation and Posting

Field Name	Description
Item ID (continued)	Section 6: Inspections IR – Inspection Requirements IE – Inspection Events Section 7: Bridge Condition C – Component Condition Ratings E – Element Identification CS – Element Conditions AP – Appraisal W – Work Events

BORDER BRIDGES

When a bridge crosses a border between two or more states, the Designated Lead State submits a full bridge record, including all features associated with the bridge, regardless of the location of the feature on either side of the border. The Neighboring State reports an abbreviated bridge record that includes feature records for all highway features carried on or passing above the bridge. The Neighboring State does not report non-highway features. Features that pass below the bridge are reported only by the Designated Lead State. The Designated Lead State is determined through agreement between the bordering States.

Concurrence as to the accuracy of the items associated with the border bridge occurs between the bordering States prior to submittal. Submittal of the border bridge data signifies such concurrence. The data reported by the Designated Lead State for a border bridge is incorporated into the Neighboring State's bridge inventory upon acceptance into the NBI, except for the data contained in the abbreviated bridge record submitted by the Neighboring State.

The Neighboring State reports only the items listed below, as values for these items may vary between States. Additional data items reported by the Neighboring State are not processed. It is essential that Item B.F.01 *(Feature Type)* values be assigned to the same features by both States so that the Designated Lead State's submitted feature data are assigned to the correct feature records in the Neighboring State's inventory.

When a border bridge is submitted by a Federal agency or Tribal government, the submitting entity determines which is the Designated Lead State, and which is the Neighboring State. The Federal agency or Tribal government submits both records; Item B.ID.1 *(Bridge Number)* may be the same for both.

When a bridge crosses an international border, the bordering State is considered the Designated Lead State, and reports a full bridge record.

Item ID	**Data Item**
B.ID.01	Bridge Number
B.ID.03	Previous Bridge Number
B.L.01	State Code
B.L.02	County Code
B.L.03	Place Code
B.L.04	Highway Agency District
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.12	Metropolitan Planning Organization
B.F.01	Feature Type
B.F.02	Feature Location
B.F.03	Feature Name
B.RT.01	Route Designation
B.RT.02	Route Number
B.RT.03	Route Direction
B.RT.04	Route Type
B.RT.05	Service Type
B.H.03	NHS Designation
B.H.06	LRS Route ID
B.H.07	LRS Mile Point
B.H.18	Crossing Bridge Number

COMPREHENSIVE EXAMPLE

These specifications include a comprehensive example to illustrate the proper recording of data items as well as the relationship between data items in each subsection and the full set of data required for a bridge. The bridge in the comprehensive example is Bridge Number 15558X in St. Louis County, Missouri. The characteristics of this bridge serve to illustrate the relational nature of the data collected for many of the subsections; the bridge crosses several features of differing types (waterway, highway, and railroad), is comprised of several material and structure types, and is posted for various vehicle loads. When possible, inventory information for this bridge is taken from existing inventory data for Missouri Bridge Number 15558, but with modifications made as necessary for illustrative purposes.

Figure 2. Elevation view of Bridge Number 15558X, looking east.

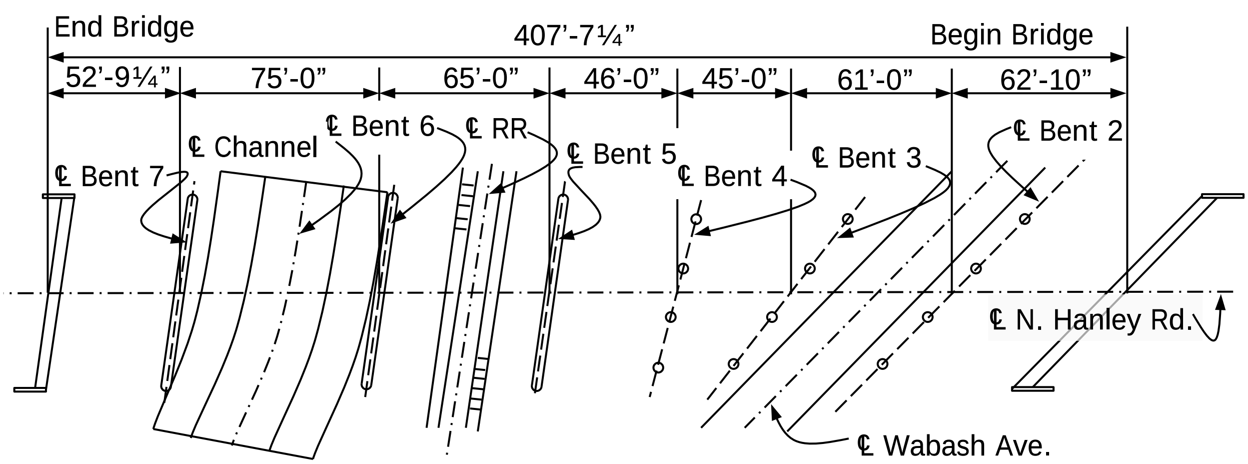


Figure 3. Plan view of Bridge Number 15558X.

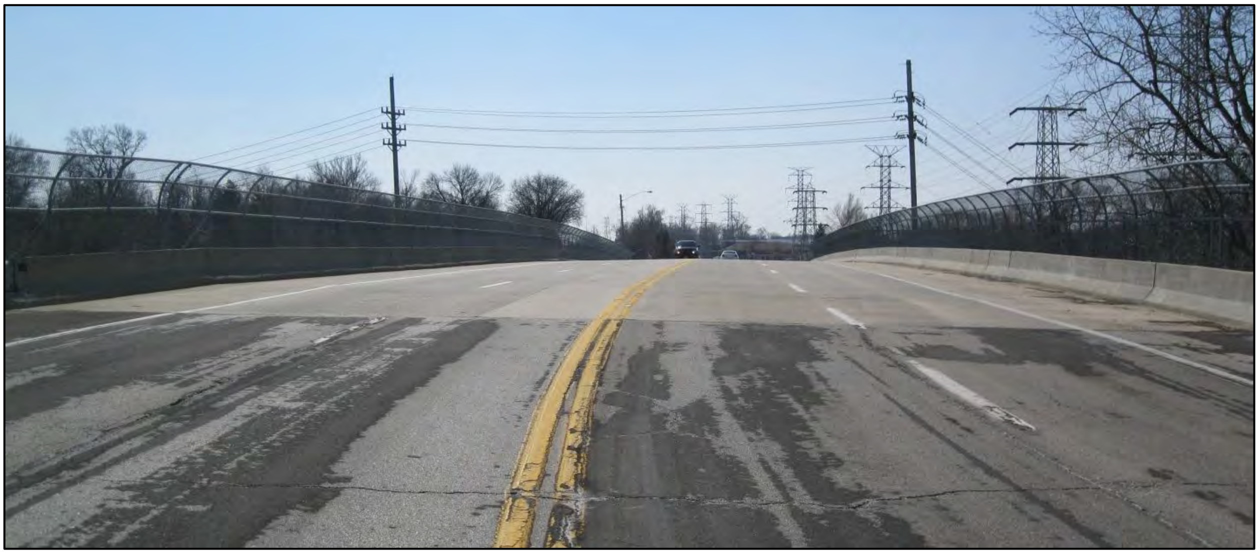


Figure 4. Approach view to Bridge Number 15558X, looking south.

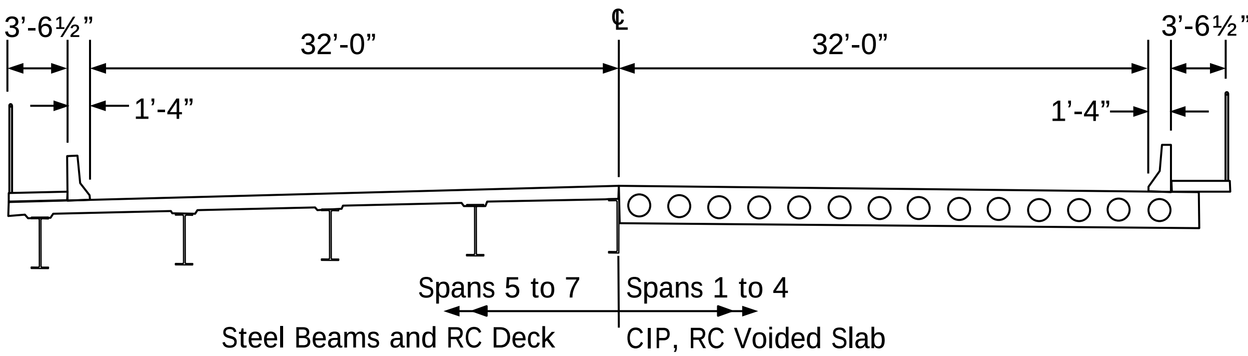


Figure 5. Typical section views for Bridge Number 15558X.

The end of each subsection presents relevant background information and a completed table of the data items in that subsection for Bridge Number 15558X. Appendix A presents the complete data set for the bridge.

SECTION 1: BRIDGE IDENTIFICATION

This section has data items that have been grouped by the following three subsections: Identification, Location, and Classification. The data items in these subsections identify, locate, and classify bridges and are considered part of the Primary Data Set. These data items have a one-to-one relationship with a bridge. The data for these items typically remain static once a bridge has been inventoried.

The following data items are included in this section.

SUBSECTION 1.1: IDENTIFICATION

Item ID	Data Item
B.ID.01	Bridge Number
B.ID.02	Bridge Name
B.ID.03	Previous Bridge Number

SUBSECTION 1.2: LOCATION

Item ID	Data Item
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

SUBSECTION 1.3: CLASSIFICATION

Item ID	Data Item
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

SUBSECTION 1.1: IDENTIFICATION

The data items in this subsection uniquely identify the bridge and are considered part of the Primary Data Set. These data items have a one-to-one relationship with a bridge. The data for these items typically remain static once a bridge has been inventoried.

The following data items are included in this subsection.

Item ID	Data Item
B.ID.01	Bridge Number
B.ID.02	Bridge Name
B.ID.03	Previous Bridge Number

<table>
<tr><th colspan="6">Bridge Number</th></tr>
<tr><td colspan="2"><u>Format</u>
AN (15)</td><td colspan="2"><u>Frequency</u>
I</td><td colspan="2"><u>Item ID</u>
B.ID.01</td></tr>
<tr><td colspan="3">Specification</td><td colspan="3">Commentary</td></tr>
<tr><td colspan="3">Report the unique bridge number assigned according to agency policy for each bridge meeting the NBIS bridge definition that is fully or partially located within the State’s boundaries, Federal agency’s responsibility or jurisdiction, or Tribal government’s responsibility or jurisdiction; regardless of inspection or financial responsibility.

Do not change the bridge number once it has been assigned and recorded, except for a rare or unusual circumstance that requires a one-time change.

When a bridge number is changed, report the previous bridge number under B.ID.03.

Report all spans from abutment to abutment as one bridge.</td><td colspan="3">There are no national policies established for assigning unique bridge numbers. Therefore, each State transportation department, Federal agency, or Tribal government develops policy for assigning unique bridge numbers.

It is preferable that a new and unique bridge number be assigned when a bridge is replaced. When any portion of the existing bridge is retained for a rehabilitated or partially replaced bridge, it is preferable to retain the existing bridge number.

It is expected that all spans of a superstructure spanning from one abutment to another be recorded as one bridge, per the NBIS bridge definition, not as multiple bridges.</td></tr>
<tr><td colspan="6">Commentary Continued</td></tr>
<tr><td colspan="6">For border bridges, the Neighboring State reports this item as part of their abbreviated bridge record. For more information, see the Border Bridges section of this document.

It is preferable that one bridge number be assigned to a bridge that supports multiple features.

It is preferable that any bridge or bridges with a closed median, where the area between the two roadways on the bridge is bridged over and can support traffic, be reported as one bridge. Closed medians may have either mountable or non-mountable curbs or barriers. It is preferable that separate superstructures with an open median (not meeting the closed median criteria above) sharing a common substructure unit or units be reported as two bridges.

It is preferable that separate bridge numbers be reported for each mainline bridge and the ramp that connects to the mainline bridge, when the ramp has at least one distinct abutment and is greater than 20 feet in length. It is also preferable that separate bridge numbers be reported for a bridge that divides into two or more separate bridges, or two or more bridges that merge into one single bridge. In both cases, the separating point between bridges should be the closest deck joint, or substructure unit to the separating point, or other logical and reasonable location as determined by the bridge owner.

Double deck bridges may be reported as one or two bridges. However, all related data items need to be compatible with the method selected.

Consult with the local FHWA division office contact for questions concerning assigning bridge numbers to unique or complex bridges.</td></tr>
</table>

Bridge Name

Format	Frequency	Item ID
AN (300)	I	B.ID.02

Specification	Commentary
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.	There are no national policies established for assigning unique bridge names. Therefore, each State transportation department, Federal agency, or Tribal government develops their own policy for assigning unique bridge names. If the bridge has no commonly known name, it is optional to report this item, but it is preferable to enter a general description.

Examples

Bridge Number A4231 has a commonly known name of O'Donnell Memorial Bridge. Report O'Donnell Memorial Bridge.

Bridge Number 8675S that carries SR 15 over Goose Creek has a commonly known name of Goose Creek Bridge. Report Goose Creek Bridge.

Bridge Number 3555C that carries Harlem Avenue over I-80 is commonly known by the names Harlem Bridge and State Route 43 Bridge. Report Harlem Bridge|State Route 43 Bridge.

Previous Bridge Number

Format	Frequency	Item ID
AN (15)	I	B.ID.03

Specification	Commentary
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.	The purpose of this item is to retain a link to data for previous bridge numbers associated with this bridge in the NBI. For border bridges, the Neighboring State reports this item as part of their abbreviated bridge record. For more information, see the Border Bridges section of this document.

Examples

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.

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.

Example Identification Data for Bridge Number 15558X

Figure 6. Elevation view of the North Hanley Road Bridge, looking east.

The North Hanley Road Bridge has been assigned Bridge Number 15558X by the State. There was no previous bridge for this crossing.

Table 1. Identification data items in the Primary Data Set for Bridge Number 15558X.

Item ID	Data Item	Value
B.ID.01	*Bridge Number*	15558X
B.ID.02	*Bridge Name*	North Hanley Road Bridge
B.ID.03	*Previous Bridge Number*	0

SUBSECTION 1.2: LOCATION

The data items in this subsection uniquely locate the bridge and are considered part of the Primary Data Set. These data items have a one-to-one relationship with a bridge. The data for these items typically remain static once a bridge has been inventoried.

The following data items are included in this subsection.

Item ID	Data Item
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

State Code

Format	Frequency	Item ID
N (2,0)	I	B.L.01

Specification	Commentary
Report the State code where the bridge is located using one of the codes listed below.	State codes are derived from the FIPS, Standard Codes for States (FIPS PUB 5-2). Federal agency or Tribal governments that own bridges which cross State borders need to choose a State code to report here and the bordering State's code in Item B.L.08 *(Border Bridge State or Country Code)*. For border bridges, the Neighboring State reports this item as part of their abbreviated bridge record. For more information, see the Border Bridges section of this document.

Specification Continued

Code	Description	Code	Description	Code	Description
1	Alabama	25	Massachusetts	47	Tennessee
2	Alaska	26	Michigan	48	Texas
4	Arizona	27	Minnesota	49	Utah
5	Arkansas	28	Mississippi	50	Vermont
6	California	29	Missouri	51	Virginia
8	Colorado	30	Montana	53	Washington
9	Connecticut	31	Nebraska	54	West Virginia
10	Delaware	32	Nevada	55	Wisconsin
11	District of Columbia	33	New Hampshire	56	Wyoming
12	Florida	34	New Jersey	60	American Samoa
13	Georgia	35	New Mexico	64	Federated States of Micronesia
15	Hawaii	36	New York	66	Guam
16	Idaho	37	North Carolina	68	Marshall Islands
17	Illinois	38	North Dakota	69	Commonwealth of the Northern Mariana Islands
18	Indiana	39	Ohio	70	Palau
19	Iowa	40	Oklahoma	72	Puerto Rico
20	Kansas	41	Oregon	74	U.S. Minor Outlying Islands
21	Kentucky	42	Pennsylvania	78	U.S. Virgin Islands
22	Louisiana	44	Rhode Island		
23	Maine	45	South Carolina		
24	Maryland	46	South Dakota		

County Code

Format	Frequency	Item ID
N (3,0)	I	B.L.02

Specification	Commentary
Report the FIPS code for the county, parish, or borough in which the bridge is located.	Use the FIPS codes in the current version of the Census of Population and Housing - Geographic Identification Code Scheme to determine the appropriate code. County and county equivalent entity codes can be found through a link at the following web site: *http://www.fhwa.dot.gov/bridge/nbi.cfm.* For border bridges, the Neighboring State reports this item as part of their abbreviated bridge record. For more information, see the Border Bridges section of this document.

Examples
Lincoln County, Nebraska, code 111. Report 111. Queens, New York, code 81. Report 81. Orleans Parish, Louisiana, code 71. Report 71.

Place Code

Format	Frequency	Item ID
N (5,0)	I	B.L.03

Specification	Commentary
Report the FIPS place code for the city, town, township, village, and other census-designated place where the bridge is located. Report 0 if there is no FIPS place code where the bridge is located.	Use the FIPS codes in the current version of the Census of Population and Housing - Geographic Identification Code Scheme to determine the city, town, township, village, or other census-designated place code, regardless of ownership. FIPS place codes can be found through a link at the following web site: *http://www.fhwa.dot.gov/bridge/nbi.cfm.* For border bridges, the Neighboring State reports this item as part of their abbreviated bridge record. For more information, see the Border Bridges section of this document.

Examples
Washington, DC, code 50000. Report 50000. Tallahassee, FL, code 70600. Report 70600. North Platte, NE, code 35000. Report 35000. Unincorporated area with no FIPS code. Report 0.

Highway Agency District

Format	Frequency	Item ID
AN (2)	I	B.L.04

Specification	Commentary
Report the State transportation department's district or region code where the bridge is located. Where districts or regions are identified by number, report that number. Where districts or regions are identified by name, report a number based on an alphabetical or organizational listing of the districts or regions, or use an abbreviation.	Federal agencies and Tribal governments may report their district or region code where the bridge is located, or use the State transportation department's district or region code. Consult with the local FHWA division office contact for questions concerning State transportation department districts or regions. Current staff listings can be found at: *http://www.fhwa.dot.gov/about/field.cfm*. For border bridges, the Neighboring State reports this item as part of their abbreviated bridge record. For more information, see the Border Bridges section of this document.

Examples

District Six. Report 6.

Region Two. Report 2.

Northwest Region. Report NW.

Latitude

Format	Frequency	Item ID
N (9,6)	I	B.L.05

Specification	Commentary
Report the latitude of the bridge in decimal degrees. Report the latitude at the same location as the LRS mile point reported for Item B.H.07 *(LRS Mile Point)*. If the location of the LRS mile point is not known, report the latitude at the location of the bridge following agency procedures.	Values reported are assumed to be for the appropriate hemisphere and are to be consistent with LRS data that uses the North American Datum of 1983. When available, HPMS data should be used to update NBI items values.

Examples
Latitude is 50º 10’ 00.00” N. Report 50.166667. Latitude is 53º 52.457' N. Report 53.874285. Latitude is 14.291368º S. Report -14.291368.

Longitude		
<u>Format</u> N (10,6)	<u>Frequency</u> I	<u>Item ID</u> B.L.06

Specification	Commentary
Report the longitude of the bridge in decimal degrees. Report the longitude at the same location as the LRS mile point reported for Item B.H.07 *(LRS Mile Point)*. If the location of the LRS mile point is not known, report the longitude at the location of the bridge following agency procedures.	Values reported are assumed to be for the appropriate hemisphere and are to be consistent with LRS data that uses the North American Datum of 1983. When available, HPMS data should be used to update NBI items values.

Examples
Longitude is 125º 10’ 00.00” W. Report -125.166667. Longitude is 166º 32.784333' W. Report -166.546406. Longitude is 144.677519º E. Report 144.677519.

Border Bridge Number

Format	Frequency	Item ID
AN (15)	I	B.L.07

Specification	Commentary
Report the neighboring State's exact bridge number as used in their Item B.ID.01 (*Bridge Number)*. Report N when the bridge does not cross a border with another State or Country. Report 0 when the bordering country does not have a bridge number.	For the purposes of the NBI, only bridges that cross a State or international border are considered border bridges. The Neighboring State reports this item as part of their abbreviated bridge record. For more information, see the Border Bridges section of this document.

Examples

I-8 westbound over the Colorado River between California and Arizona. California and Arizona have shared responsibility. California's bridge number is 58 0312L and Arizona's is 000000000001701.

California reports 000000000001701.
Arizona reports 58 0312L.

I-95 northbound over the St. Mary's River between Florida and Georgia. Florida assumes 100% responsibility.

Florida reports Georgia's bridge number.
Georgia reports Florida's bridge number.

Border Bridge State or Country Code

Format	Frequency	Item ID
AN (2)	I	B.L.08

Specification	Commentary
Report the neighboring State code using the codes listed in Item B.L.01 *(State Code).* Report CA for Canada or MX for Mexico when the bridge crosses those borders. Do not report this item when the bridge does not cross a border with another State or Country.	Use this item to indicate bridges crossing borders of States or countries. The Neighboring State reports this item as part of their abbreviated bridge record. For more information, see the Border Bridges section of this document.

Examples

A bridge crosses the border between California and Arizona.

California reports 4.

Arizona reports 6.

A bridge crosses the border between California and Mexico. California reports MX.

The National Park Service (Federal agency) is the bridge owner for a bridge that crosses the borders of Virginia and the District of Columbia. The National Park Service reports 51 when Item B.L.01 *(State Code)* is 11, and reports 11 when Item B.L.01 *(State Code)* is 51.

Border Bridge Inspection Responsibility

Format	Frequency	Item ID
AN (1)	I	B.L.09

Specification	Commentary
Report the border bridge inspection responsibility for any entity within the State geographical boundaries, regardless of ownership, using one of the following codes. Code Description 0 No responsibility 1 Shared responsibility with bordering State or country 2 Full responsibility Do not report this item when the bridge does not cross a border with another State or Country.	The intent of this item is to capture the border bridge inspection responsibility for any entity within the State geographical boundaries, for all inspection types, regardless of ownership (Federal, State, city, county, toll authority etc.). Agency inspection responsibility should be documented in interagency agreements or memorandums of understanding and included as part of the bridge file or record. The Neighboring State reports this item as part of their abbreviated bridge record. For more information, see the Border Bridges section of this document.

Examples

Border bridge between California and Arizona with shared inspection responsibility. California is responsible for underwater inspection and Arizona is responsible for routine inspection.

Arizona reports 1.
California reports 1.

Border bridge between Florida and Georgia. Florida is responsible for inspections and has 100% responsibility.

Florida reports 2.
Georgia reports 0.

Border bridge between Illinois and Missouri with shared maintenance responsibility. Missouri has responsibility for inspection.

Missouri reports 2.
Illinois reports 0.

Border Bridge Designated Lead State

Format	Frequency	Item ID
N (2,0)	I	B.L.10

Specification	Commentary
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 intent of this item is to capture the State which has been designated by agreement between the two bordering states to report a full bridge record for the border bridge. For more information, see the Border Bridges section of this document. The Neighboring State reports this item as part of their abbreviated bridge record.

Examples

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.

Border bridge between Florida and Georgia. Florida is responsible for inspections and has 100% responsibility. Through agreement, Florida is determined to be the Designated Lead State. Florida and Georgia report 12.

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.

Bridge Location		
Format AN (300)	Frequency I	Item ID B.L.11

Specification	Commentary
Report a narrative description of the bridge location.	It is preferred that the narrative describe the location and distance of the bridge from a distinguishable feature along the same route the bridge carries. Include additional information as needed to locate the bridge. Distinguishable features should be on official highway department, State, local, or Federal agency maps.

Examples
Report 3.2 mi. south of the junction of SR 35. Report 0.2 miles south of I-80 middle-tier of 3 ramps ramp to southbound State Route 15. Report 5.7 miles north of State Route 10 on State Route 15, then 1.8 miles east on Buckingham Road. Bear right at the unmarked fork at the 1.1-mile point of Buckingham Road. Report At the entrance to the Veterans Affairs facility in Bath, NY.

Metropolitan Planning Organization		
Format AN (300)	Frequency I	Item ID B.L.12

Specification	Commentary
Report the name(s) of the Metropolitan Planning Organization(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.	This item only needs to be reported if a highway carried by the bridge is on the National Highway System, as indicated in Item B.H.03 *(NHS Designation)*. If the State transportation department and its MPOs have established a numeric or alphanumeric identification system for MPOs, that identifier can be used to report this item if it is used consistently. This item can be used to assist in calculating MPO performance measures and targets required by the National Performance Management Measures regulation. The names of Regional Planning Organizations (RPOs) or single county planning organizations do not need to be reported for this item. The National Performance Management Measures regulation only applies to MPOs and not RPOs. For border bridges, the Neighboring State reports this item as part of their abbreviated bridge record. For more information, see the Border Bridges section of this document.

Examples
Bridge is located within the boundary of the Des Moines Area MPO. Report Des Moines Area MPO. 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 report: DVRPC|NJTPA. Bridge is partially located within the boundary of the Southeast Texas Regional Planning Commission MPO. Report Southeast Texas Regional Planning Commission MPO or report SETRPC MPO. Bridge is not located within the boundary of an MPO. Report N.

Example Location Data for Bridge Number 15558X

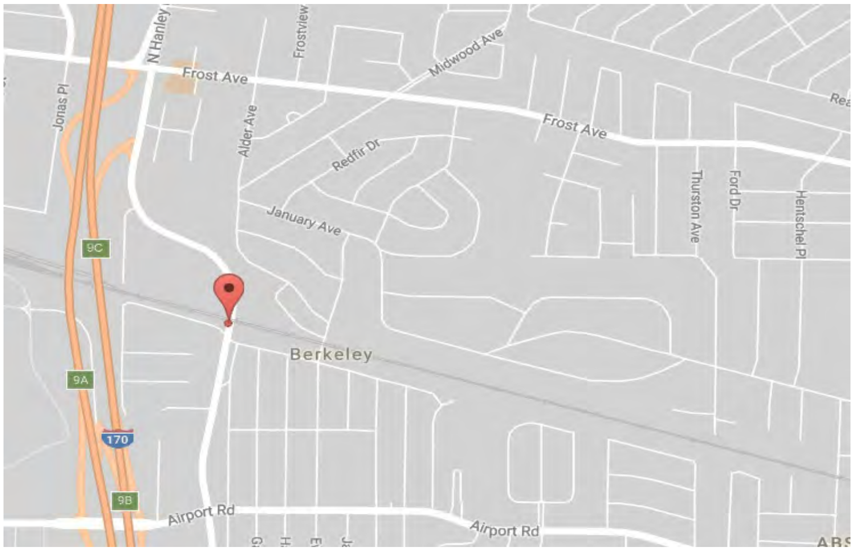


Figure 7. Location map for Bridge Number 15558X. (Source: Google Earth)

The bridge is in the city of Berkeley, Missouri, an inner-ring suburb of St. Louis, located in St. Louis County and within the boundaries of the East-West Gateway Council of Governments MPO. It does not cross a border with another State or country. It is located at 38 degrees, 45 minutes, 19.28 seconds north, and 90 degrees, 20 minutes, 4.15 seconds west. It is located within the boundaries of MoDOT District 5. It carries North Hanley Road and is located 0.4 miles north from the intersection with Airport Road.

Data are not reported for Items B.L.08 *(Border Bridge State or Country Code)*, B.L.09 *(Border Bridge Inspection Responsibility)* and B.L.10 *(Border Bridge Inspection Responsibility)* since the bridge does not cross a border with another State or country.

Table 2. Location data items in the Primary Data Set for Bridge Number 15558X.

Item ID	Data Item	Value
B.L.01	*State Code*	29
B.L.02	*County Code*	189
B.L.03	*Place Code*	4906
B.L.04	*Highway Agency District*	5
B.L.05	*Latitude*	38.755356
B.L.06	*Longitude*	-90.334486
B.L.07	*Border Bridge Number*	N
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*	0.4 miles north on N Hanley Rd from intersection with Airport Rd
B.L.12	*Metropolitan Planning Organization*	East-West Gateway Council of Governments

SUBSECTION 1.3: CLASSIFICATION

The data items in this subsection provide classification data for the bridge and are considered part of the Primary Data Set. These data items have a one-to-one relationship with a bridge. The data for these items typically remain static once a bridge has been inventoried.

The following data items are included in this subsection.

Item ID	Data Item
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

Owner

Format	Frequency	Item ID
AN (4)	I	B.CL.01

Specification	Commentary
Report the agency that has ownership of the bridge using one of the following codes. Code — Description S01 State transportation department S02 State park, forest, or reservation agency S03 State toll authority SX Other State agency L01 County highway agency L02 Town or township highway agency L03 City or municipal highway agency L04 Local park, forest, or reservation agency L05 Local toll authority LX Other local agency F01 Agriculture Research Service (ARS) F02 Department of Energy (DOE) F03 General Services Administration (GSA) F04 National Aeronautics and Space Administration (NASA) F05 Smithsonian – National Zoo F06 Tennessee Valley Authority (TVA) F07 U.S. Department of Veterans Affairs F08 Federal Emergency Management Agency (FEMA) F09 International Boundary and Water Commission, United States Section (USIBWC) FX Other Federal agency Codes continued next page.	Use the hierarchy of State, Federal, county, city, railroad, transit, and other private entity for multiple owners of a bridge. Use code S01 for District of Columbia, Puerto Rico, and U.S. Territories (Guam, American Samoa, Northern Mariana Islands, and Virgin Islands) Use codes FL01 through FLX for Federal Lands Management agencies identified at the following FHWA website https://flh.fhwa.dot.gov/programs/fltp/. Use codes D01 through DX for bridges owned by the Department of Defense. Use code T for transit agency or authority for air, bus, light rail, and port regardless of whether the entity is considered State, local, or private. Use code P for private owners other than railroad or transit. Use code R for highway bridges owned by railroad entities that are not considered a transit agency or authority.

Specification Continued – Owner

Code	Description
FL01	Bureau of Indian Affairs (BIA)
FL02	Bureau of Land Management (BLM)
FL03	Bureau of Reclamation (USBR)
FL04	U.S. Fish and Wildlife Service (FWS)
FL05	National Park Service (NPS)
FL06	U.S. Army Corps of Engineers (USACE)
FL07	U.S. Forest Service (USFS)
FL0X	Other Federal Lands Management Agency
I	Indian Tribal Government
D01	Air Force
D02	Army
D03	Navy/Marines
D04	Pentagon
D05	National Security Agency (NSA)
DX	Other Department of Defense
T	Transit agency/authority
P	Private
R	Railroad
U	Unknown
X	Other

Maintenance Responsibility

Format	Frequency	Item ID
AN (4)	I	B.CL.02

Specification	Commentary
Report the agency that has primary maintenance responsibility for the bridge using one of the codes listed in Item B.CL.01 *(Owner)*.	Use the hierarchy of State, Federal, county, city, railroad, and other private entity for determining primary responsibility for maintenance of a bridge. Use code S01 for District of Columbia, Puerto Rico, and U.S. Territories (Guam, American Samoa, Northern Mariana Islands, and Virgin Islands). Use codes FL01 through FLX for Federal Lands Management agencies identified at the following FHWA website https://flh.fhwa.dot.gov/programs/fltp/. Use codes D01 through DX for bridges maintained by the Department of Defense. Use code T for transit agency or authority for air, bus, light rail, and port regardless of whether the entity is considered State, local, or private. Use code P for private entities other than railroad or transit. Use code R for highway bridges maintained by railroad entities that are not considered a transit agency or authority.

Federal or Tribal Land Access

Format	Frequency	Item ID
AN (30)	I	B.CL.03

Specification	Commentary
Report the Federally managed and/or Indian Tribal Government lands using one or more of the following codes, for the bridge owned by a State or local agency and carrying a highway that leads to or traverses through the Federal or Tribal lands. Report multiple codes separated by pipe (|) delimiters. Code — Description N — Not applicable BIA — Indian Tribal Government or Bureau of Indian Affairs BLM — Bureau of Land Management NPS — National Park Service USACE — U.S. Army Corps of Engineers USBR — Bureau of Reclamation USFS — U.S. Forest Service USFWS — U.S. Fish and Wildlife Service X — Other Report N when the highway carried by the bridge is not owned by a State or local agency and/or does not lead to or traverse through Federal or Tribal lands.	This item is used to identify bridges owned by State or local agencies on highways that lead to and/or traverse through any Federally managed land or Tribal government property. These bridges may be eligible to receive funding from the Federal Lands Access Program under 23 U.S.C. 204. Consider those bridges that are located on the identified highway to the nearest intersecting highway owned by a State or local agency. For assistance in locating Federal properties, contact Federal Lands Highway at: *http://flh.fhwa.dot.gov/about/contact.htm.*

Historic Significance

Format	Frequency	Item ID
AN (1)	I	B.CL.04

Specification

Report the historic significance of the bridge using one of the following codes.

Code	Description
1	Bridge is on the National Register
2	Bridge is eligible for the National Register
3	Bridge is in a historic district that is on or eligible for the National Register, and contributes to the eligibility of the district
4	Bridge is in a historic district that is on or eligible for the National Register, but does not contribute to the eligibility of the district
5	Bridge is potentially eligible for the National Register, or potentially contributes to a historic district, but has not been evaluated according to the criteria for listing
6	Bridge is on a State or local historic register, but is not eligible for the National Register
7	Historic significance of the bridge has not been determined
N	Bridge is not eligible for the National Register, and is not in a historic district eligible for the National Register

Commentary

This item is used to report the historic significance of bridges. Bridges that are historically significant are subject to Section 106 of the National Historic Preservation Act of 1966, and 36 CFR 800 (Protection of Historic Properties). 36 CFR 800 governs the Section 106 process, and outlines how agencies are to consult with various parties, identify historic properties, and assess the effects of undertakings to properties.

Undertakings to historically significant bridges or their surroundings are also subject to Section 4(f) of the Department of Transportation Act of 1966, and 23 CFR Part 774 (Parks, Recreation Areas, Wildlife and Waterfowl Refuges, and Historic Sites). 23 CFR Part 774 governs the Section 4(f) process, considers how the property is used as a resource, and outlines the project approval process when undertakings are proposed.

36 CFR Part 70 (National Register of Historic Places) identifies the attributes that may make a property historically significant, and prescribes the evaluation criteria and procedures for listing properties on the National Register.

Determinations of eligibility are generally not made with the purpose of eventual listing on the National Register of Historic Places. Rather, the evaluation criteria for listing is used to assess historical significance with the purpose of assessing the effects of undertakings, and to fulfill the goals of 23 USC 144(g) Historic Bridges. Determinations of eligibility are normally made by the relevant federal agency, typically FHWA for highway bridges, and can change when circumstances or conditions change, such as age or bridge integrity. As such, the eligibility status and reported code can change with time.

Commentary Continued – Historic Significance
Use code 2 when the bridge has been determined to be eligible for listing on the National Register even though the nomination and listing process have not concluded or are not being pursued. Use code 5 when the bridge has attributes that may make it historically significant as indicated by the National Register criteria for evaluation and listing. This code may also apply when a bridge was previously evaluated but requires reevaluation because its current attributes, such as age, may make it historically significant. Use code 6 when a bridge has local historic value, but has been determined to be not eligible for the National Register. Undertakings may be subject to the Section 4(f) process, but without the same level of consultation as prescribed by Section 106. Use code N when the other codes do not apply.

Toll

Format	Frequency	Item ID
AN (1)	I	B.CL.05

Specification	Commentary
Report the toll status of the bridge using one of the following codes. Code — Description 1 — Toll bridge not under FHWA Toll Agreement 2 — Toll bridge under FHWA Toll Agreement 3 — Bridge carries a toll road not under FHWA Toll Agreement 4 — Bridge carries a toll road under FHWA Toll Agreement N — Bridge does not carry a toll road and is not a toll bridge Report this item if only a portion of the bridge is tolled such as if an HOV Toll lane is on the same bridge as a freeway.	Use code 1 when tolls on a toll bridge are paid specifically to use the bridge and not part of a facility which requires an FHWA Toll Agreement (23 U.S.C. 129). Use code 2 when an interstate highway toll bridge is under a FHWA Toll Agreement (23 U.S.C. 129). Bridge has a separate agreement from the highway segment. Use code 3 when the tolls on a toll road are paid to use the facility, which includes the roadway and the bridge. No FHWA Toll Agreement or unknown whether a toll agreement exists. Use code 4 when the bridge is on an Interstate toll highway segment under a FHWA Toll Agreement (23 U.S.C. 129). Bridge is a part of the toll segment. More tolling program information related to 23 U.S.C. 129 can be found at: https://www.fhwa.dot.gov/ipd/tolling_and_pricing/ and in the FHWA Informational Memorandum - Federal Tolling Programs under the Moving Ahead for Progress in the 21st Century Act.

Emergency Evacuation Designation

Format	Frequency	Item ID
AN (1)	I	B.CL.06

Specification	Commentary
Report whether the route carried on the bridge is an emergency evacuation route using one of the following codes. Code – Description N – Not an Emergency evacuation route. Y – Emergency evacuation route.	This item is used by FHWA with other items, as per 23 U.S.C. 144(b), to classify bridges according to serviceability, safety, and essentiality for public use and considers the potential impacts to emergency evacuation routes and to regional and national freight and passenger mobility if the serviceability of the bridge is restricted or diminished. Emergency evacuation routes may be designated for various events such as hurricanes, earthquakes, tsunami, dam failure, and other hazardous events. Refer to the State Emergency Management Agency for designated emergency evacuation routes.

Example Classification Data for Bridge Number 15558X

The bridge is owned and maintained by St. Louis County, and is not eligible for the National Register for Historic Places. It is not on a Federal or Tribal land access road; is not on a toll road; and is not on an emergency evacuation route.

Table 3. Classification data items in the Primary Data Set for Bridge Number 15558X.

Item ID	Data Item	Value
B.CL.01	*Owner*	L01
B.CL.02	*Maintenance Responsibility*	L01
B.CL.03	*Federal or Tribal Land Access*	N
B.CL.04	*Historic Significance*	N
B.CL.05	*Toll*	N
B.CL.06	*Emergency Evacuation Designation*	N

SECTION 2: BRIDGE MATERIAL AND TYPE

This section has data items that have been grouped by the following three subsections: Span Material and Type, Substructure Material and Type, and Roadside Hardware. The data items in these subsections identify the structural materials, structure types, and structural configurations that make up a bridge.

The data items in Span Material and Type subsection identify the bridge configuration based on material(s), type(s), and continuity. These items are considered part of the Span Data Set and have a many-to-one relationship with a bridge when applicable.

The data items in the Substructure Material and Type subsection identify the bridge substructure and foundation material(s) and type(s). These items are considered part of the Substructure Data Set and have a many-to-one relationship with a bridge when applicable.

The data items in the Roadside Hardware subsection identify crash-tested roadside hardware. These data items are considered part of the Primary Data Set and have a one-to-one relationship with a bridge.

The data for items in this section typically remain static once a bridge has been inventoried. The following data items are included in this section.

SUBSECTION 2.1: SPAN MATERIAL AND TYPE

Item ID	Data Item
B.SP.01	Span Configuration Designation
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

SUBSECTION 2.2: SUBSTRUCTURE MATERIAL AND TYPE

Item ID	Data Item
B.SB.01	Substructure Configuration Designation
B.SB.02	Number of Substructure Units
B.SB.03	Substructure Material
B.SB.04	Substructure Type
B.SB.05	Substructure Protective System
B.SB.06	Foundation Type
B.SB.07	Foundation Protective System

SUBSECTION 2.3: ROADSIDE HARDWARE

Item ID	Data Item
B.RH.01	Bridge Railings
B.RH.02	Transitions

SUBSECTION 2.1: SPAN MATERIAL AND TYPE

The data items in this subsection identify the span and deck configurations based on material(s), type(s), and continuity for the bridge, and are considered part of the Span Data Set. These data items have a many-to-one relationship with a bridge when applicable.

Data items in this subsection are reported for each span configuration present in the bridge. A span configuration characterizes all spans of similar material, type, and continuity. Spans of similar configuration do not need to be contiguous to be reported in the same data set.

All bridges have at least one span configuration; therefore at least one data set must be reported for each bridge. Additional data sets are reported when applicable.

Do not report these data items for bridges and culverts under fill: 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)*, and B.SP.13 *(Deck Stay-In-Place Forms)*.

The data for items in this subsection typically remain static once a bridge has been inventoried. The following data items are included in this subsection.

Item ID	Data Item
B.SP.01	Span Configuration Designation
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

Span Configuration Designation

Format	Frequency	Item ID
AN (3)	I	B.SP.01

Specification	Commentary
Report the assigned span configuration designation using one of the following codes. Code / Description M## Main A## Approach C## Culvert V## Culvert extension W## Widening Replace the ## characters in the above codes with sequential numbers, with leading zeros, assigned to each span configuration.	This item captures how spans of the reported bridge configuration are classified and designated. Except for culverts, each bridge has at least one main span. Main spans include all spans of most bridges or the major span(s) of a sizable bridge. Replacing the "##" characters in the codes with a sequential number (e.g., M01, A01, A02, etc.) identifies each unique span configuration present on the bridge.

Commentary Continued

A bridge may or may not have approach spans. Approach spans are typically those of a different material, type, or design than the main span and are typically at one or both ends of the main span.

Consider the span(s) of vaulted abutments as an approach span.

Use code C for spans that convey water through or under a roadway embankment and are designed hydraulically to take advantage of submergence to increase water carrying capacity.

Use code V when a culvert is extended using dissimilar construction.

Use code W for widened portions of main or approach spans with dissimilar construction. Widening data sets do not contribute to the calculation of the total number of spans for the bridge.

Examples

Four-span steel plate girder bridge. This bridge has one span data set. Report M01.

Double-leaf bascule bridge with four steel box girder approach spans. This bridge has two span data sets.

- Report M01 for the bascule data set.
- Report A01 for the steel box girder data set.

Examples Continued – Span Configuration Designation
Six-span bridge with two continuous steel plate girder main spans and four simply supported steel plate girder approach spans. This bridge has two span data sets. • Report M01 for the continuous steel plate girder data set. • Report code A01 for the simply supported steel plate girder data set. Four-barrel corrugated steel pipe culvert, modified by adding four additional HDPE round pipes along the roadway centerline to increase hydraulic capacity. This bridge has two span data sets. • Report C01 for the steel pipes data set. • Report C02 for the HDPE pipes data set. Steel truss main span bridge with three prestressed concrete multi-beam approach spans at the north end, and two steel multi-beam approach spans at the south end. This bridge has three span data sets. • Report M01 for the steel truss data set. • Report A01 for the north approach data set. • Report A02 for the south approach data set. Single span reinforced concrete tee-beam bridge widened with prestressed concrete box beams. This bridge has two span data sets. • Report M01 for the reinforced concrete tee-beam data set. • Report W01 for the prestressed concrete box beams data set. 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 C01 for the three-sided frame culvert data set. • Report V01 for the four-sided box culvert data set. Single span steel beam bridge widened using the same superstructure/deck construction. This bridge has one span data set. Report M01.

Number of Spans

Format	Frequency	Item ID
N (4,0)	I	B.SP.02

Specification	Commentary
Report the number of spans.	This item captures the number of spans of the configuration(s) designated in item B.SP.01 *(Span Configuration Designation)*. If the number of barrels or spans varies, report the maximum number.

Examples

Four-span steel plate girder bridge. This bridge has one span data set. Report 4.

Double-leaf bascule bridge with four steel box girder approach spans. This bridge has two span data sets.

- Report 1 for the bascule main span data set.
- Report 4 for the box girder approach span data set.

Six-span bridge with two continuous steel plate girder main spans and four simply supported steel plate girder approach spans. This bridge has two span data sets.

- Report 2 for the main span data set.
- Report 4 for the approach span data set.

Four-barrel corrugated steel pipe culvert, modified by adding four additional HDPE round pipes along the roadway centerline to increase hydraulic capacity. This bridge has two span data sets.

- Report 4 for the steel pipes data set.
- Report 4 for the HDPE pipes data set.

Three steel girder spans with concrete vaulted/cellular abutments that enclose a reinforced concrete slab span at each end of the bridge. This bridge has two span data sets.

- Report 3 for the steel girder main span data set.
- Report 2 for the reinforced concrete approach span data set.

Four-sided concrete box culvert that collects runoff at a single-barrel inlet at the northeast corner of an intersection, and at a three-barrel inlet at the northwest corner. The barrels merge beneath the intersection, and all four barrels outlet to the southeast corner. This bridge has one span data set. Report 4.

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 culvert data set.
- Report 1 for the four-sided box culvert data set.

Twin concrete box girder bridge that has eastbound and westbound lanes separated by a 1” median gap. Eastbound portion of superstructure is supported by two piers, and westbound portion is supported by three piers due to unusual terrain restrictions. This bridge has one span data set. Report 4.

Number of Beam Lines

Format	Frequency	Item ID
N (3,0)	I	B.SP.03

Specification	Commentary
Report the number of principal beam lines. Report 1 for bridges where Item B.SP.06 *(Span Type)* is F01, F02, S01, or S02. Report 0 for bridges where Item B.SP.06 *(Span Type)* is P01 or P02.	Principal beam lines include the main longitudinal load-carrying members of the superstructure such as beams, girders, trusses, and arches or arch ribs, but 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.

Examples

Timber multi-beam bridge with 12 beams. Report 12.

Steel through truss bridge with two trusses and ten stringers. Report 2.

Flared three-span tee-beam bridge with 12 beams at the south end and 17 beams at the north end. Report 14.

Steel arch bridge with three arch ribs. Report 3.

Concrete arch bridge with masonry spandrel walls. Report 1.

Four-barrel corrugated steel pipe culvert, modified by adding four additional HDPE round pipes along the roadway centerline to increase hydraulic capacity. This bridge has two span data sets.

- Report 0 for the steel pipes data set.
- Report 0 for the HDPE pipes data set.

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.

Span Material		
Format AN (3)	Frequency I	Item ID B.SP.04

Specification	Commentary
Report the principal span material type using one of the following codes. Code Description A01 Aluminum C01 Reinforced concrete – cast-in-place C02 Reinforced concrete – precast C03 Prestressed concrete – pre-tensioned C04 Prestressed concrete – cast-in-place post-tensioned C05 Prestressed concrete – precast post-tensioned CX Concrete – other 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 M01 Masonry – block M02 Masonry – stone P01 Plastic – Polyethylene PX Plastic - other S01 Steel – rolled shapes S02 Steel – welded shapes S03 Steel – bolted shapes S04 Steel – riveted shapes S05 Steel – bolted and riveted shapes SX Steel – other Codes continued next page.	A principal span member includes the main longitudinal load-carrying members of the span such as beams, girders, trusses, arches, or pipes, but does not include the floor system. Use code C04 or C05, as applicable, for prestressed concrete superstructures that utilize both pre-tensioning and post-tensioning. Use code M01 for masonry made from bricks or concrete blocks. Use code M02 for natural stone. Use code P01 for plastics that include HDPE and PE materials typically used for pipes.

Specification Continued – Span Material	
<u>Code</u>	<u>Description</u>
T01	Timber – glue laminated
T02	Timber – nail laminated
T03	Timber – solid sawn
T04	Timber – stress laminated
TX	Timber – other
X	Other

Examples – Span Material

Spliced concrete girder: post-tensioned, precast, pre-tensioned bulb-T. Report C05.

Stress laminated timber slab. Report T04.

Concrete encased steel rolled beam. Report S01.

Bolted steel truss with timber stringers. Report S03.

Cast-in-place reinforced concrete tee-beams strengthened with carbon fiber FRP. Report C01.

Corrugated steel pipes with bolted seams. Report S03.

Corrugated steel pipe culvert with welded seams, modified by adding additional HDPE round pipes to lengthen the culvert along the roadway centerline. This bridge has two span data sets.

- Report S02 for the steel pipes data set.
- Report P01 for the HDPE pipes data set.

Three-sided, cast-in-place reinforced concrete frame culvert, lengthened by adding a four-sided precast reinforced concrete frame culvert to the end of the barrel. This bridge has two span data sets.

- Report C01 for the three-sided frame data set.
- Report C02 for the four-sided frame data set.

Terra cotta pipes. Report X.

Span Continuity

Format	Frequency	Item ID
AN (1)	I	B.SP.05

Specification	Commentary
Report the span continuity using one of the following codes. Code / Description 1 Simple or single span 2 Continuous 3 Continuous for live loads only 4 Cantilever 5 Cantilever with pin and hanger 6 Frame 7 Buried	This item captures the continuity of the span(s) in the configuration. Use code 2 for bridges designed continuous for permanent (dead) loads and live loads. Also, use code 2 for cable stayed and suspension bridges, and for multi-span arches. Use code 3 for bridges designed as simple spans for permanent (dead) loads and continuous for live loads. When it is unknown if the superstructure was designed as continuous for live loads, code this item consistent with the assumption used in the load rating calculations. Use code 6 for three-sided and four-sided frames that are not buried. Use code 7 for pipe culverts and other structures that rely on soil-structure interaction to support vertical loads.

Examples

Two prestressed concrete girder simple spans. Report 1.

Three-span bridge with cantilevered end spans that are unsupported at the extreme ends. Report 4.

Steel rigid K-frame. Report 6.

Two prestressed concrete girder simple spans with continuous deck designed to provide continuity for live load over the pier. Report 3.

Three-span concrete girder bridge with cantilever and suspended center span. Report 4.

Three-span steel girder bridge with cantilever and suspended pin and hanger center span. Report 5.

Three-barrel monolithic concrete frame bridge that is not buried. Report 6.

Four-barrel corrugated steel pipe culvert. Report 7.

Span Type

Format	Frequency	Item ID
AN (3)	I	B.SP.06

Specification	Commentary
Report the span type using one of the following codes.	Adjacent girders/beams are those sections that are placed directly next to each other and are touching or nearly touching. Spread girders/beams are those sections that are spaced so that the deck spans the space between the sections. Box girder/beams include boxes, tubs, and cellular structures where interior surfaces may or may not be accessible. Use code F01 for three-sided rigid frames. Use code F02 for rigid four-sided concrete box bridges. Use code G01 or G02, as applicable, for bulb-tee and deck bulb-tee girders/beams. Use code G09 for superstructures with girder and floor beam systems regardless of the girder shape. Use code G10 for through girder type superstructures regardless of the girder shape. Use code P02 for pipes that rely on the stability of surrounding soils to maintain their structural shape.

Code	Description
A01	Arch – under fill without spandrel
A02	Arch – open spandrel
A03	Arch – closed spandrel
A04	Arch – through
A05	Arch – tied
B01	Box girder/beam – single
B02	Box girder/beam – multiple adjacent
B03	Box girder/beam – multiple spread
B04	Box girder/beam – segmental
F01	Frame – three-sided
F02	Frame – four-sided
F03	Frame – K-shaped
F04	Frame – delta-shaped
G01	Girder/beam – I-shaped adjacent
G02	Girder/beam – I-shaped spread
G03	Girder/beam – tee-beam
G04	Girder/beam – inverted tee-beam
G05	Girder/beam – double-tee adjacent
G06	Girder/beam – double-tee spread
G07	Girder/beam – channel adjacent
G08	Girder/beam – channel spread
G09	Girder/beam – girder & floor beam
G10	Girder/beam – through girder
GX	Girder/beam – other

Codes continued next page.

Specification Continued – Span Type	
Code	Description
L01	Cable – suspension
L02	Cable – cable-stayed
L03	Cable – extradosed
LX	Cable – other
M01	Movable – vertical lift
M02	Movable – bascule
M03	Movable – swing
MX	Movable – other
P01	Pipe - Rigid
P02	Pipe - Flexible
S01	Slab – solid
S02	Slab – voided
T01	Truss – deck
T02	Truss – through
T03	Truss – pony
X01	Other – railroad flat car
X02	Other – ferry transfer
X03	Other – floating
X	Other

Span Protective System

Format	Frequency	Item ID
AN (3)	I	B.SP.07

Specification	Commentary
Report the span protective system using one of the following codes. Code / Description 0 None A01 Admixture – internally sealed A02 Admixture – low permeability A03 Admixture – polymer impregnated A04 Admixture – corrosion inhibitor A05 Admixture – ASR inhibitor AX Admixture – other C01 Coating – paint C02 Coating – sealer C03 Coating – hot dip galvanizing C04 Coating – metalizing/thermal spray CX Coating – other E01 Encasement – concrete EX Encasement – other M01 Membrane – built-up M02 Membrane – sheet M03 Membrane – liquid applied MU Membrane – unknown MX Membrane – other P01 Patina – uncoated weathering steel Codes continued next page.	Code this item consistent with the material reported for Item B.SP.04 *(Span Material)*. 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 code 0 when the span is unprotected. Use code 0 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. Non-protective anti-graffiti and aesthetic coatings are not considered when coding this item. Use code C01 for weathering steel that has been painted. Use code C02 for sealers such as silanes, siloxanes, linseed oils, etc. Use code P01 only for weathering grades of steel. For timber, use code T01 for oil-based or water-borne timber preservatives. Use code C01 for paints and stains. Use the appropriate code for span members under fill that have a protective system.

Specification Continued – Span Protective System	
<u>Code</u>	<u>Description</u>
S01	Sacrificial – cathodic, passive
S02	Sacrificial – cathodic, active
SX	Sacrificial – other
T01	Treated – timber preservative
U	Unknown
X	Other

Examples – Span Protective System

Low permeability concrete slab bridge with waterproofing sheet membrane. Report M02.

Weathering steel multi-beam bridge that has the beam ends painted to protect from leakage through the joints. Report P01.

Deck Interaction

Format	Frequency	Item ID
AN (2)	I	B.SP.08

Specification	Commentary
Report the type of interaction between the superstructure and deck for the span configuration using one of the following codes. Code — Description CS — Composite – shored construction CU — Composite – unshored construction IM — Integral or monolithic NC — Non-composite Do not report this item when Item B.SP.09 *(Deck Material and Type)* is 0.	This item 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. Use code NC to indicate that the deck and the superstructure act independently. Use code CU to indicate that the deck acts composite with the superstructure, and that the superstructure can carry its own self-weight, plus that of the deck concrete prior to curing.

Commentary Continued

Use code CS to indicate that 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.

Use code IM to indicate that 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 code IM for slabs and orthotropic steel decks.

When the type of interaction is unknown, code this item consistent with the assumption used in the load rating calculations.

Examples

Steel rolled shape beams with cast-in-place deck. No shear connectors. Report NC.

Precast concrete bulb-tee with cast-in-place deck. Shear connectors extend into the deck. Deck was cast without shoring. Report CU.

Precast concrete double-tee beam bridge with an additional structural deck cast on top. Report CU.

Steel plate girder with cast-in-place deck. Shear connectors extend into the deck. Girders were shored during deck construction to maintain stability. Report CS.

Cast-in-place tee-beam bridge. Report IM.

Adjacent box beam bridge. Traffic rides on the top flange of the box. Report IM.

Steel box girder with orthotropic deck. Deck plate acts as top flange of the box section. Report IM.

Deck Material and Type

Format	Frequency	Item ID
AN (3)	I	B.SP.09

Specification	Commentary
Report the deck material and type for the span configuration using one of the following codes. Code — Description 0 — None A01 — Aluminum C01 — Reinforced concrete – cast-in-place C02 — Reinforced concrete – precast C03 — Prestressed concrete – pre-tensioned C04 — Prestressed concrete – cast-in-place post-tensioned C05 — Prestressed concrete – precast post-tensioned CX — Concrete – other F01 — FRP composite – aramid fiber F02 — FRP composite – carbon fiber F03 — FRP composite – glass fiber FX — FRP composite – other S01 — Steel – open grid S02 — Steel – filled or partially filled grid S03 — Steel – plate S04 — Steel – orthotropic S05 — Steel – corrugated SX — Steel – other T01 — Timber – glue laminated T02 — Timber – nail laminated T03 — Timber – solid sawn T04 — Timber – stress laminated TX — Timber – other X — Other	In cases where the superstructure configuration may have a combination of deck materials and/or types, code the predominant deck material and type based on the deck area. Use the applicable code for superstructure types with integral top flanges that serve as the deck, such as concrete tee-beams and box beams/girders. For slabs, and for the slab portion of three-sided and four-sided concrete rigid frame bridges and culverts not under fill, use the same applicable material code as used in Item B.SP.04 *(Span Material)*. Use code 0 for the following bridge and culvert types when under fill, as these do not have a deck component: slabs, arches without spandrels, closed spandrel arches, pipes, and three-sided or four-sided rigid frames. Use code C02, C03, or C05, as applicable, for full depth precast panels only. Use code C01 or C04, as applicable, for cast-in-place concrete on partial depth structural panels that are not just considered stay-in-place forms.

<table>
<tr><th colspan="3">Wearing Surface</th></tr>
<tr><td><u>Format</u>
AN (3)</td><td><u>Frequency</u>
I</td><td><u>Item ID</u>
B.SP.10</td></tr>
</table>

<table>
<tr><th>Specification</th><th>Commentary</th></tr>
<tr><td>Report the predominant wearing surface material type protecting the deck or slab for the span configuration using one of the following codes.

<u>Code</u> <u>Description</u>
0 None

B01 Bituminous (asphalt)

C01 Concrete – monolithic
C02 Concrete – unmodified
C03 Concrete – latex modified
C04 Concrete – low slump
C05 Concrete – fiber reinforced
C06 Concrete – microsilica
C07 Concrete – polyester
CX Concrete – other
CU Concrete – unknown

E01 Earth – gravel or soil

P01 Polymer – epoxy
P02 Polymer – polyester
PX Polymer – other

S01 Steel

T01 Timber – running planks

X Other

Do not report this item when Item B.SP.09 (Deck Material and Type) is 0.</td><td>When a span configuration has a combination of wearing surface types, code the predominant wearing surface type based on the deck or slab area.

Do not consider patching materials when coding this item.

Use code 0 when no additional sacrificial concrete thickness or wearing surface is included on the deck or slab.

Use codes C01 through CU for overlays that contain portland cement.

Use code C01 when there is an additional sacrificial thickness cast concurrently with the structural deck or slab.

Use code C02 when an additional placement of concrete of the same concrete material as the deck or slab is placed after the deck or slab has cured.

Use code CU when a concrete wearing surface exists, but the specific material composition is unknown.

Use code S01 when a steel grid deck is fabricated with an additional sacrificial thickness. Code S01 is not intended for temporary steel plates.

Use code T01 where running planks are added on timber decks or slabs.</td></tr>
</table>

Examples
Bridge with 2” asphalt wearing surface over a sheet waterproofing membrane. Report B01. Bridge with latex modified concrete overlay topped with an epoxy polymer overlay. Report P01.

Deck Protective System

Format	Frequency	Item ID
AN (3)	I	B.SP.11

Specification	Commentary
Report the deck protective system for the span configuration using one of the following codes. Code / Description 0 None A01 Admixture – internally sealed A02 Admixture – low permeability A03 Admixture – polymer impregnated A04 Admixture – corrosion inhibitor A05 Admixture – ASR inhibitor AX Admixture – other C01 Coating – paint C02 Coating – silane/siloxane C03 Coating – methacrylate CX Coating – other M01 Membrane – built up M02 Membrane – sheet M03 Membrane – liquid applied MU Membrane – unknown MX Membrane – other P01 Patina – weathering steel X Other Do not report this item when Item B.SP.09 *(Deck Material and Type)* is 0.	Code this item consistent with the predominant material reported in Item B.SP.09 *(Deck Material and Type)*. In cases where the deck 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 code 0 when there is no known internal or external protective system in place. Use code A01 for internally sealed concrete systems that use wax beads in the concrete. After the concrete cures, it is heated to melt the wax and seal the concrete. Use code A02 when low permeability concrete is used with admixtures such as flyash, microsilica, or slag. Use code A05 when admixtures are used to inhibit alkali-silica reactivity (ASR). Do not use codes C02 and C03 when the material is applied for localized crack repair. Use code M01 when the membrane is built up using combined layers of liquid and preformed/sheet membranes. Use code MU when a membrane exists, but the type is unknown. Use code MX when a membrane type is known, but does not match the types specified for codes M01, M02, or M03.

Examples – Deck Protective System
Bridge with 2” asphalt wearing surface over a sheet waterproofing membrane. Report M02. Bridge deck constructed with polymer impregnated concrete and sealed with a flood coat of methacrylate. Report C03.

Deck Reinforcing Protective System

Format	Frequency	Item ID
AN (3)	I	B.SP.12

Specification	Commentary
Report the type of deck reinforcing protective system for the span configuration using one of the following codes for concrete decks and slabs. Code Description 0 None C01 Coating – epoxy coated C02 Coating – galvanized C03 Coating – metalized CX Coating – other R01 Reinforcing – stainless, clad R02 Reinforcing – stainless, solid R03 Reinforcing – high chromium R04 Reinforcing – FRP, aramid fiber R05 Reinforcing – FRP, carbon fiber R06 Reinforcing – FRP, glass fiber R07 Reinforcing – FRP, other RX Reinforcing – other S01 Sacrificial – cathodic, passive S02 Sacrificial – cathodic, active SX Sacrificial – other X Other Report this item only if Item B.SP.09 *(Deck Material and Type)* is concrete (i.e. codes C01 to CX).	In cases where the span(s) 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. If the top and bottom mat have different protective systems, report the protective system for the top mat. Do not consider bar chairs or other reinforcing steel supports when coding this item. Use code 0 when steel reinforcement is unprotected, such as with black steel. Use codes C01 to CX and R01 to RX when any (e.g., top mat only) or all the reinforcing steel in the deck is protected by the selected steel type. Use code S02 when impressed currents are used as the cathodic protection system.

Example
Bridge deck constructed with black reinforcing bars, later widened with a top mat of epoxy coated bars and bottom mat of black bars. This bridge has two span data sets. • Report 0 for the original deck data set. • Report C01 for the widened deck data set.

Deck Stay-In-Place Forms

Format	Frequency	Item ID
AN (3)	I	B.SP.13

Specification	Commentary
Report the type of deck stay-in-place form for the span configuration using one of the following codes. Code — Description 0 — None C01 — Concrete – reinforced C02 — Concrete – prestressed F01 — FRP composite M01 — Metal T01 — Timber X — Other Do not report this item when Item B.SP.09 *(Deck Material and Type)* is 0.	Use this item to identify forms used in construction that remain in place by design or owner preference. When a span configuration has a combination of stay-in-place form types, code the predominant type based on the deck area. Use code C01 when a precast reinforced concrete panel (partial depth) is used with a cast-in-place reinforced concrete placement on top. Use code C02 when a precast prestressed concrete panel (partial depth) is used with a cast-in-place reinforced concrete placement on top. This item is not intended to be used for materials installed only for debris shielding, or when Item B.SP.09 *(Deck Material and Type)* is S05 (Steel – corrugated).

Examples

Bridge constructed using 3” thick prestressed concrete form panels. Completed deck is 8” thick. Report C02.

Bridge with reinforced concrete deck placed originally with removable forms, subsequently widened with reinforced concrete deck placed on metal stay-in-place forms. This bridge has two span data sets.

- Report 0 for the original data set.
- Report M01 for the widened data set.

Example Span Material and Type Data for Bridge Number 15558X

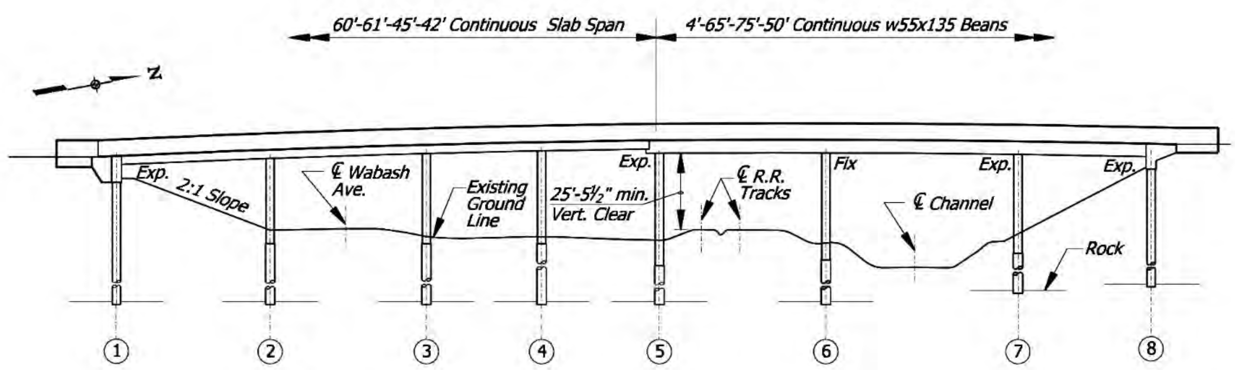


Figure 8. Elevation view for Bridge number 15558X, looking west. (Source: Missouri DOT)

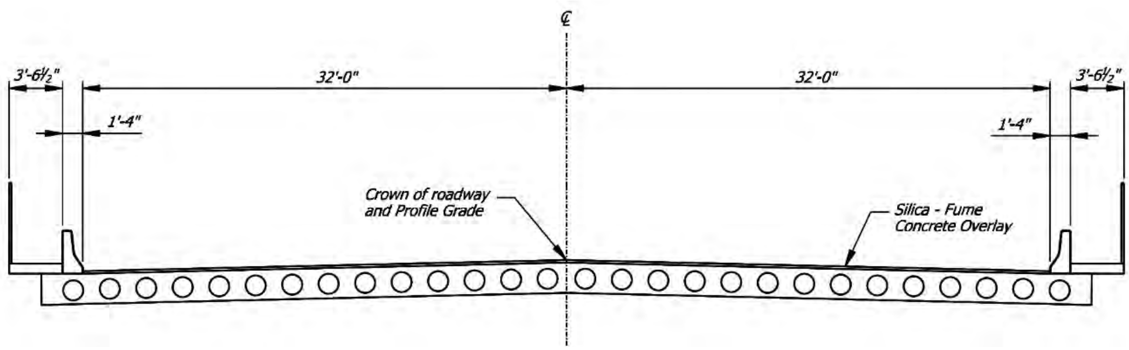


Figure 9. Cross-section view for Bridge Number 15558X, spans one through four. (Source: Missouri DOT)

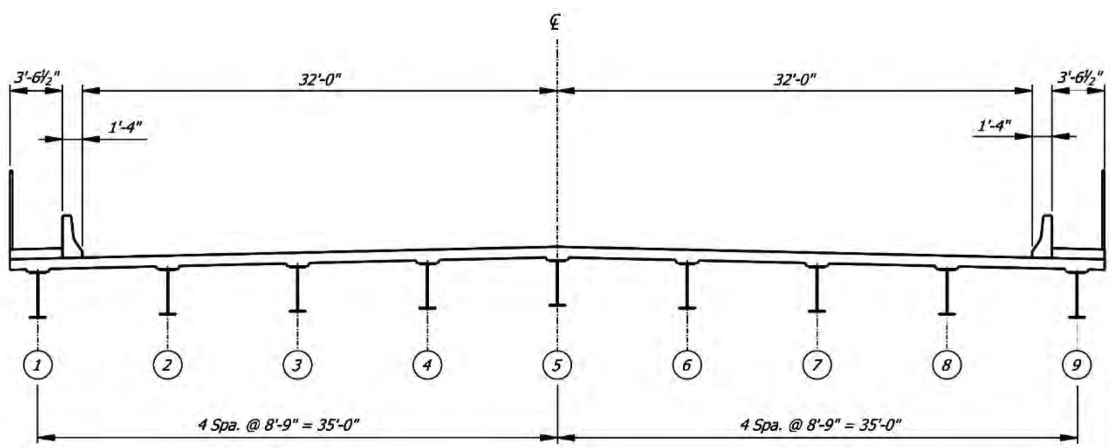


Figure 10. Cross-section view for Bridge Number 15558X, spans five through seven. (Source: Missouri DOT)

The bridge has seven spans with an intermediate hinge in span four.

Main spans one through three are continuous, cast-in-place reinforced concrete voided slabs. Slabs are reinforced with uncoated bars (black bars) and protected with an active cathodic protection system. Slabs have a microsilica modified concrete overlay with a surface penetrating sealer. (Value 1)

Main span four is a cast-in-place reinforced concrete voided slab supported on one end by cantilever portions of the steel beams extending from span five. Slabs are reinforced with uncoated bars (black bars) and protected with an active cathodic protection system. Slabs have a microsilica modified concrete overlay with a surface penetrating sealer. (Value 2)

Main spans five through seven are continuous, rolled steel beams (W35x135) that are painted. There are nine beam lines in each span. The beams support a cast-in-place, reinforced concrete deck that is reinforced with epoxy coated reinforcing steel. The beams are composite with the deck. The deck has a monolithic, sacrificial concrete wearing surface with a surface penetrating sealer. The deck has no stay-in-place forms. (Value 3)

This bridge has three span data sets.

Table 4. Span Material and Type data items in the Span Data Sets for Bridge Number 15558X.

Item ID	Data Item	Value (1)	Value (2)	Value (3)
B.SP.01	*Span Configuration Designation*	M01	M02	M03
B.SP.02	*Number of Spans*	3	1	3
B.SP.03	*Number of Beam Lines*	1	1	9
B.SP.04	*Span Material*	C01	C01	S01
B.SP.05	*Span Continuity*	2	4	2
B.SP.06	*Span Type*	S02	S02	G01
B.SP.07	*Span Protective System*	S02	S02	C01
B.SP.08	*Deck Interaction*	IM	IM	CU
B.SP.09	*Deck Material and Type*	C01	C01	C01
B.SP.10	*Wearing Surface*	C06	C06	C01
B.SP.11	*Deck Protective System*	C02	C02	C02
B.SP.12	*Deck Reinforcing Protective System*	S02	S02	C01
B.SP.13	*Deck Stay-In-Place Forms*	0	0	0

SUBSECTION 2.2: SUBSTRUCTURE MATERIAL AND TYPE

The 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. These data items have a many-to-one relationship with a bridge when applicable.

Data items for this subsection 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.

These 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.

The data for items in this subsection typically remain static once a bridge has been inventoried. The following data items are included in this subsection.

Item ID	Data Item
B.SB.01	Substructure Configuration Designation
B.SB.02	Number of Substructure Units
B.SB.03	Substructure Material
B.SB.04	Substructure Type
B.SB.05	Substructure Protective System
B.SB.06	Foundation Type
B.SB.07	Foundation Protective System

Substructure Configuration Designation

Format	Frequency	Item ID
AN (3)	I	B.SB.01

Specification	Commentary
Report the substructure set designation using one of the following codes. Code / Description A## Abutment P## Pier or Bent W## Widening Replace the ## characters in the above codes with sequential numbers, with leading zeros, assigned to each substructure configuration.	This item captures how the reported substructure configuration is designated. The substructure is the portion of a bridge below the bearings or below the springline of an arch, which transfers loads to the foundation. This includes the walls of three-sided and four-sided rigid frame bridges. 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.

Commentary Continued

An abutment is a substructure unit located at the end of a bridge that transfers loads from the superstructure to the foundation while providing lateral support for the approach roadway embankment. Typically, a bridge has two abutments, but 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.

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.

Use code W for widened portions of abutments or piers/bents with dissimilar substructure construction.

Examples

Single-span concrete rigid frame bridge. This bridge has one designated substructure data set. Report A01.

Two-span concrete, three-sided, rigid frame culvert. This bridge has two designated substructure data sets.

- Report A01 for the end support frame legs data set.
- Report P01 for the intermediate support frame leg data set.

Four-span multi-beam bridge with integral concrete abutments and concrete column piers. This bridge has two designated substructure data sets.

- Report A01 for the abutment data set.
- Report P01 for the pier data set.

Examples Continued – Substructure Configuration Designation
Three-span bridge with intermediate concrete pier walls and cantilevered end spans that are unsupported at the extreme ends. This bridge has one designated substructure data set. Report P01. Three-span suspension bridge with concrete tower piers, concrete pier walls supporting the ends of the suspension spans, eight timber bents supporting the approach spans, and concrete stub abutments at each end of the bridge. The north abutment has a spread footing on rock foundation and the south abutment has a steel H-pile foundation. This bridge has five designated substructure data sets. • Report A01 for the north abutment data set. • Report A02 for the south abutment data set. • Report P01 for the towers data set. • Report P02 for the concrete pier walls data set. • Report P03 for the timber bents data set. Five-span girder bridge with concrete stub abutments and concrete wall piers. Bridge is widened with concrete stub abutments and concrete column piers. 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.

Number of Substructure Units

Format	Frequency	Item ID
N (3,0)	I	B.SB.02

Specification	Commentary
Report the number of substructure units.	This item captures the number of substructure units of similar material, design, and foundation type that are being reported.

Examples

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.

Three-span bridge with intermediate concrete pier walls and cantilevered end spans that are unsupported at the extreme ends. This bridge has one substructure data set. Report 2.

Three-span suspension bridge with concrete tower piers, concrete pier walls supporting the ends of the suspension spans, eight timber bents supporting the approach spans, and concrete stub abutments at each end of the bridge. The north abutment has a spread footing on rock foundation and the south abutment has a steel H-pile foundation. This bridge has five substructure data sets.

- Report 1 for the north abutment data set.
- Report 1 for the south abutment data set.
- Report 2 for the towers data set.
- Report 2 for the concrete pier walls data set.
- Report 8 for the timber bents data set.

Five-span girder bridge with concrete stub abutments and concrete wall piers. Bridge is widened with concrete stub abutments and concrete column piers. This bridge has three substructure data sets.

- Report 2 for the stub abutments (including the widening) data set.
- Report 4 for the concrete wall piers data set.
- Report 4 for the concrete columns data set.

Substructure Material

Format	Frequency	Item ID
AN (3)	I	B.SB.03

Specification	Commentary
Report the principal substructure material type using one of the following codes. Code / Description 0 None A01 Aluminum C01 Reinforced concrete – cast-in-place C02 Reinforced concrete – precast C03 Prestressed concrete – pre-tensioned C04 Prestressed concrete – cast-in-place post-tensioned C05 Prestressed concrete – precast post-tensioned CX Concrete – other E01 Earth – reinforced soil F01 FRP composite – aramid fiber F02 FRP composite – carbon fiber F03 FRP composite – glass fiber FX FRP composite – other I02 Iron – cast I01 Iron – wrought M01 Masonry – block M02 Masonry – stone P01 Plastic – Polyethylene PX Plastic – other Codes continued next page.	This item reflects the material which provides the support for the transfer of the superstructure load to the foundation. In cases where the substructure unit(s) may have a combination of materials, use the code for the predominant material that transfers load to the foundation. Use code 0 when the superstructure rests directly on the foundation. Use code C04 or C05, as applicable, for prestressed concrete substructure unit(s) that utilize both pre-tensioning and post-tensioning. Use code E01 when the superstructure rests directly on the reinforced soil mass. Code E01 is not intended to be used for MSE walls when the superstructure does not rest directly on the reinforced soil mass. Use code M01 for masonry made from bricks or concrete blocks. Use code M02 for natural stone. Use code S06 for filled or unfilled steel pipe piles. Use code C01 for cased and uncased cast-in-place concrete piles, and for driven corrugated, fluted, or spiral-welded shell-cased concrete piles.

Specification Continued – Substructure Material

Code	Description
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
SX	Steel – other
T01	Timber – glue laminated
T02	Timber – nail laminated
T03	Timber – solid sawn
T04	Timber – stress laminated
TX	Timber – other
X	Other

Examples – Substructure Material

Closed spandrel arch founded on cast-in-place concrete spread footings on rock. Report C01.

Reinforced concrete full height cantilever abutment. Report C01.

Pile bent abutment with timber piles, timber lagging, and concrete cap. Report C01.

Pile bent abutment with steel H-piles, timber lagging, and rolled steel cap. Report S01.

Reinforced concrete stub abutment on steel piles with a MSE wall. Report C01.

GRS abutment with precast, prestressed concrete box beams placed directly on the reinforced soil mass. Report E01.

Substructure Type

Format	Frequency	Item ID
AN (3)	I	B.SB.04

Specification

Report the abutment, pier, or bent design type using one of the following codes.

Code	Description
0	None
A01	Abutment – cantilever/wall
A02	Abutment – stub
A03	Abutment – open/spill through
A04	Abutment – integral
A05	Abutment – semi-integral
A06	Abutment – gravity
A07	Abutment – counterfort
A08	Abutment – pile bent with lagging
A09	Abutment – crib
A10	Abutment – cellular/vaulted
A11	Abutment – reinforced soil
A12	Abutment – footing only
AX	Abutment – other
B01	Bent – column or open
B02	Bent – column with web wall
B03	Bent – pile
B04	Bent – straddle or c-shaped
BX	Bent – other
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
P07	Pier – tower
P08	Pier – footing only
PX	Pier – other

Codes continued next page.

Commentary

In cases where the substructure may have a combination of designs due to retrofitting actions, use the code for the predominant design.

Both piers and bents provide the same function; however, a pier has only one footing at each substructure unit (the footing may serve as a pile cap) while a bent has several footings or no footing, as is the case with a pile bent.

Use code 0 when the superstructure rests directly on the foundation.

Use codes A01 to A10, as appropriate, if the superstructure load is supported by a substructure unit, which is in turn supported by piles or the reinforced soil mass. Use code A11 when the superstructure rests directly on the reinforced soil mass.

Use code A10 when the space between wingwalls, abutment stem, approach slab, and footings is hollow.

Use code A12 or P08 when the superstructure rests only on a footing, grade beam, or thrust block.

Use code B04 when a highway or railroad passes directly beneath or through the bent.

Use code P06 for piers that support movable bridges and the equipment needed to open and close the bridge.

Use code P07 for towers of complex bridges such as cable-stayed and suspension bridges.

Specification Continued – Substructure Type

Code	Description
U	Unknown
X	Other

Examples – Substructure Type

Reinforced concrete full-height cantilever abutment. Report A01.

Reinforced concrete stub abutment on steel piles with a MSE wall. Report A02.

Pile bent type abutment with painted steel piles, timber lagging, and steel cap. Report A08.

Single-span closed spandrel arch that bears directly on a thrust block founded on rock. Report A12.

Single-span timber beams resting on concrete grade beam. Report A12.

Single-span railroad flat car with ends resting on unreinforced soil. Report AX.

Intermediate bent supported on concrete-filled steel pipe piles connected with a concrete cap beam. Report B03.

Reinforced concrete pier wall widened with a single reinforced concrete column. This bridge has two substructure data sets.

- Report P01 for the pier data set.
- Report P02 for the widening data set.

Reinforced concrete pier with three concrete columns on concrete footing/pile cap. Report P03.

Substructure Protective System

Format	Frequency	Item ID
AN (3)	I	B.SB.05

Specification	Commentary
Report the substructure protective system using one of the following codes. Code — Description 0 — None A01 — Admixture – internally sealed A02 — Admixture – low permeability A03 — Admixture – polymer impregnated A04 — Admixture – corrosion inhibitor A05 — Admixture – ASR inhibitor AX — Admixture – other C01 — Coating – paint C02 — Coating – sealer C03 — Coating – galvanizing/metalizing CX — Coating – other E01 — Encasement – concrete EX — Encasement – other P01 — Patina – weathering steel S01 — Sacrificial – cathodic, passive S02 — Sacrificial – cathodic, active SX — Sacrificial – other T01 — Treated – timber preservative X — Other Do not report this item when Item B.SB.04 *(Substructure Type)* is 0.	Code this item consistent with the predominant material reported in Item B.SB.03 *(Substructure Material)*. In cases where the substructure 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 code 0 when the substructure is unprotected. Use code 0 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. Anti-graffiti coatings are not considered when coding this item. Use code C01 for weathering steel that has been painted. Use code C02 for sealers such as silanes, siloxanes, linseed oils, etc. Use code E01 for steel piles of pile bents that are encased in concrete. Use code P01 only for weathering grades of steel. For timber, use code T01 for oil-based or water-borne timber preservatives. Use code C01 for paints and stains.

Examples – Substructure Protective System
Painted weathering steel pier cap. Report C01. Pile bent with preservative treated timber piles and concrete cap sealed with siloxane. Report C02. Pile bent type abutment with painted steel H-pile foundation, timber lagging, and reinforced concrete cap with active cathodic protection. Report S02.

Foundation Type

Format	Frequency	Item ID
AN (3)	I	B.SB.06

Specification	Commentary
Report the foundation type using one of the following codes. Code / Description E01 Earth – reinforced soil F01 Footing – not on rock F02 Footing – on rock F03 Footing – on reinforced soil P01 Pile – steel H-shape P02 Pile – steel pipe P03 Pile – concrete, cast-in-place P04 Pile – prestressed concrete P05 Pile – timber P06 Pile – auger cast P07 Pile – micropile P08 Pile – composite P09 Pile – FRP composite PX Pile – other S01 Drilled shaft – single S02 Drilled shafts – multiple S03 Caisson U Unknown X Other	In cases where the substructure has a combination of foundations due to retrofitting actions, use the code for the predominant foundation. Do not consider localized repairs to original foundation types when reporting this item. Use code E01 when the superstructure bears directly on the reinforced soil mass. Use codes F01 to F03, as appropriate, when the substructure or footing bears directly on the ground, such as a grade beam, floor, or gravity wall. Use code F02 only if the design plans, or subsequent subsurface investigation, indicate that the entire foundation is supported by rock. Use code F03 if the superstructure load is supported by a substructure unit, which is in turn supported by the reinforced soil mass. Use code P02 for filled or unfilled steel pipe piles. Use code P03 for cased and uncased cast-in-place concrete piles, and for driven corrugated, fluted, or spiral-welded shell-cased concrete piles. Use code P04 for solid or hollow-core square, octagonal, or cylindrical piles. Use code P06 for piles that have concrete or grout placed by pumping through the stem of the auger pipe as the auger is withdrawn.

Commentary Continued – Foundation Type
Use code P07 for small diameter piles, typically less than 12 inches, that are drilled, then grouted. Use code P08 for piles in which the length is composed of two or more pile types or materials, excluding pile tips. Use code P09 when FRP composite piles are used for construction but not as repairs to existing piles of a different type. Use codes S01 and S02 for cased or uncased drilled shafts. Use code S03 for footings sunk into position by excavation through or beneath the caisson structure.

Examples – Foundation Type
Three-sided concrete frame culvert with a spread footing keyed into bedrock, modified by adding a four-sided box culvert placed on crushed stone bedding to the end of the barrel to widen the culvert. This culvert has two substructure data sets. • Report F02 for the three-sided concrete frame culvert data set. • Report F01 for the four-sided box culvert data set. Closed spandrel arch founded on spread footings on bedrock. Report F02. Pile bent abutment with steel H-piles, timber lagging, and rolled steel cap. Report P01. Reinforced concrete stub abutment on steel H-piles with an MSE wall. Report P01. Precast, reinforced concrete arch structure constructed on cast-in-place concrete footing with steel H-pile foundation. Report P01. Pile bent abutment with timber piles, timber lagging, and concrete cap. Report P05. GRS abutment with precast, prestressed concrete box beams placed directly on the reinforced soil mass. Report E01. Four corrugated steel circular pipes placed on crushed stone bedding. Do not report this item.

Foundation Protective System

Format	Frequency	Item ID
AN (3)	I	B.SB.07

Specification	Commentary
Report the foundation protective system using one of the following codes. Code — Description 0 — None A01 — Admixture – internally sealed A02 — Admixture – low permeability A03 — Admixture – polymer impregnated A04 — Admixture – corrosion inhibitor A05 — Admixture – ASR inhibitor AX — Admixture – other C01 — Coating – paint C02 — Coating – sealer C03 — Coating – galvanizing/metalizing CX — Coating – other E01 — Encasement – concrete EX — Encasement – other P01 — Patina – weathering steel S01 — Sacrificial – cathodic, passive S02 — Sacrificial – cathodic, active SX — Sacrificial – other T01 — Treated – timber preservative U — Unknown X — Other	Code this item consistent with the predominant material reported in Item B.SB.06 *(Foundation Type)*. In cases where the foundation 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 code 0 when the foundation is unprotected. Use code 0 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. Anti-graffiti coatings are not considered when coding this item. Use code C02 for sealers such as silanes, siloxanes, linseed oils, etc. Use code E01 for steel piles of pile bents that are encased in concrete. Use code P01 only for weathering grades of steel. For timber, use code T01 for oil-based or water-borne timber preservatives. Use code C01 for paints and stains.

Examples – Foundation Protective System
Closed spandrel arch founded on spread footings on bedrock. Report 0. Pile bent abutment with timber piles treated with creosote, timber lagging, and concrete cap. Report T01. Pile bent with painted steel H-piles and rolled steel cap. Report C01. GRS abutment with precast, prestressed concrete box beams placed directly on the reinforced soil mass. Report 0. Three-sided concrete frame culvert with a spread footing keyed into bedrock, modified by adding a four-sided box culvert placed on crushed stone bedding to the end of the barrel to widen the bridge. The four-sided box was constructed with high performance concrete that provides for low permeability. • Report 0 for the three-sided concrete frame culvert data set. • Report A02 for the four-sided box culvert data set. Precast, reinforced concrete arch bridge constructed on cast-in-place concrete footing with unpainted steel H-pile foundation. Report 0.

Example Substructure Material and Type Data for Bridge Number 15558X

The bridge has eight substructure units; two abutments and six piers. All substructure units and their foundations do not have protective systems.

The south abutment is a reinforced concrete stub abutment. The foundation consists of four reinforced concrete drilled shafts. (Value 1)

The north abutment is a semi-integral, reinforced concrete abutment. The foundation consists of three reinforced concrete drilled shafts. (Value 2)

Piers two through four are reinforced concrete column bents. There are four columns per bent. Each column is an extension of a single reinforced concrete drilled shaft. The bent caps are integral with the reinforced concrete voided slab superstructure. (Value 3)

Piers five and six, near the railroad tracks, are reinforced concrete column bents that have reinforced concrete web walls (crash walls). There are three columns per bent. Each column is an extension of a single reinforced concrete drilled shaft. The reinforced concrete bent caps are not integral with the steel beam superstructure. (Value 4)

Pier seven is a reinforced concrete column bent. There are three columns. Each column is an extension of a single reinforced concrete drilled shafts. The reinforced concrete bent caps are not integral with the steel beam superstructure. (Value 5)

Table 5. Substructure Material and Type data items in the Substructure Data Set for Bridge Number 15558X.

Item ID	**Data Item**	**Value (1)**	**Value (2)**	**Value (3)**	**Value (4)**	**Value (5)**
B.SB.01	*Substructure Configuration Designation*	A01	A02	P01	P02	P03
B.SB.02	*Number of Substructure Units*	1	1	3	2	1
B.SB.03	*Substructure Material*	C01	C01	C01	C01	C01
B.SB.04	*Substructure Type*	A02	A05	B01	B02	B01
B.SB.05	*Substructure Protective System*	0	0	0	0	0
B.SB.06	*Foundation Type*	S02	S02	S02	S02	S02
B.SB.07	*Foundation Protective System*	0	0	0	0	0

SUBSECTION 2.3: ROADSIDE HARDWARE

The data items in this subsection identify crash tested roadside hardware on the bridge. These data items are considered part of the Primary Data Set and have a one-to-one relationship with a bridge.

The data for these items typically remain static once a bridge has been inventoried. The following data items are included in this subsection.

Item ID	Data Item
B.RH.01	Bridge Railings
B.RH.02	Transitions

Roadside hardware is commonly associated with bridges and serves as a traffic safety feature to redirect errant vehicles and reduce crash severity. The items in this subsection are inventoried to indicate if hardware at the bridge is required, present, or has been crash tested. Do not consider the condition of the hardware when reporting these items.

Table 6 contains the applicable crash testing codes used for all the roadside hardware items in this subsection. The applicable code may be based on an approved analytical equivalency evaluation.

Refer to the FHWA Office of Highway Safety website for policy and guidance on roadside hardware *(http://safety.fhwa.dot.gov/roadway_dept/policy_guide/road_hardware/).* Also, refer to the Task Force 13 – Hardware Guide website for roadside hardware, systems specifications, and individual component details.

The AASHTO LRFD Bridge Design Specifications are currently used to design bridge railings. The AASHTO Manual for Assessing Safety Hardware (MASH), which replaces NCHRP Report 350, is currently used for testing and evaluating the safety performance of roadside hardware.

The AASHTO Roadside Design Guide addresses appropriate bridge railings, roadside barriers, barrier end treatments, and crash cushions.

Table 6. Roadside Hardware codes.

Code	Test Level Code						Description
	1	2	3	4	5	6	
N							Not applicable – roadside hardware is not required.
	MYY1	MYY2	MYY3	MYY4	MYY5	MYY6	Roadside hardware successfully crash-tested for AASHTO MASH.
	3501	3502	3503	3504	3505	3506	Roadside hardware successfully crash-tested for NCHRP Report 350.
	2301	2302	2303				Roadside hardware successfully crash-tested for NCHRP Report 230.
	2391	2392	2393				Roadside hardware successfully crash-tested for NCHRP Report 239.
	891	892	893				Roadside hardware successfully crash-tested for 1989 AASHTO Guide Specifications for Bridge Railings.
X							Roadside hardware successfully crash-tested for other criteria.
AYY							Roadside hardware has not been crash-tested but meets AASHTO Standard Specifications for Highway Bridges.
SYY							Roadside hardware has not been crash-tested but meets approved agency standards.
I							Roadside hardware has not been crash-tested and does not meet approved agency standards.
0 (zero)							None - roadside hardware is required, but required roadside hardware is not present.

Note that YY, for codes in *Table 6*, represents the last two digits of the year for the crash testing publication, AASHTO Specifications, or agency approved standards.

Bridge Railings

Format	Frequency	Item ID
AN (4)	I	B.RH.01

Specification	Commentary
Report the crash-test level for the bridge railings using one of the codes in *Table 6*.	This roadside hardware includes all types and shapes of bridge railings (parapets, median barriers, or structure mounted) located on the bridge or that cross over culverts. Use the code that first applies going from the bottom (Code 0) of *Table 6* to the top (MYY), if there are more than one type of bridge railing on the bridge.

Commentary Continued

A list of crash-tested bridge railings may be obtained from the FHWA Office of Highway Safety website at: http://safety.fhwa.dot.gov/roadway_dept/policy_guide/road_hardware/.

Bridge railings designed to meet AASHTO specifications prior to 1964 may not meet current specifications.

Prior to 1993, bridge railings were tested according to the AASHTO Guide Specifications for Bridge Railings, NCHRP Report 230, or NCHRP Report 239.

Since 1993, bridge railings were crash-tested and classified according to the guidelines shown in NCHRP Report 350.

Refer to the May 30, 1997 memo at the FHWA Office of Highway Safety website for a list of crash-tested bridge railings with equivalent NCHRP Report 350 test levels.

In 2009 the AASHTO Manual for Assessing Safety Hardware (MASH) replaced NCHRP 350. In 2015 AASHTO and FHWA entered into a MASH joint implementation agreement.

Refer to State, Federal agency, or Tribal government policies for acceptable bridge railing standards.

Use code I when no information is known about the crash test level or an agency approved standard. Also, use code I when an overlay is applied to the deck/slab and the height no longer meets the original geometry requirements of the crash-tested rail.

Transitions

Format	Frequency	Item ID
AN (4)	I	B.RH.02

Specification	Commentary
Report the crash-test level for transition railings using one of the codes in *Table 6*.	This roadside hardware serves as the transition from the roadside approach railing to the bridge railing and is firmly attached and anchored to the bridge railing to provide sufficient tension in the transition rail upon impact. Use the code that first applies going from the bottom (Code 0) of *Table 6* to the top (MYY), if there are more than one type of transition.

Commentary Continued

A list of crash-tested transitions may be obtained from the FHWA Office of Highway Safety website at: http://safety.fhwa.dot.gov/roadway_dept/policy_guide/road_hardware/.

Since 1993, transitions to bridge railings have been crash tested and classified according to the guidelines shown in NCHRP Report 350.

In 2009 the AASHTO Manual for Assessing Safety Hardware (MASH) replaced NCHRP 350. In 2015 AASHTO and FHWA entered into a MASH joint implementation agreement.

Refer to State, Federal agency, or Tribal government policies for acceptable transition railing standards.

Use code I when no information is known about the crash test level or an agency approved standard. Also, use code I when an overlay is applied to the deck/slab and the height no longer meets the original geometry requirements of the crash-tested transition.

Examples – Bridge Railings/Transitions

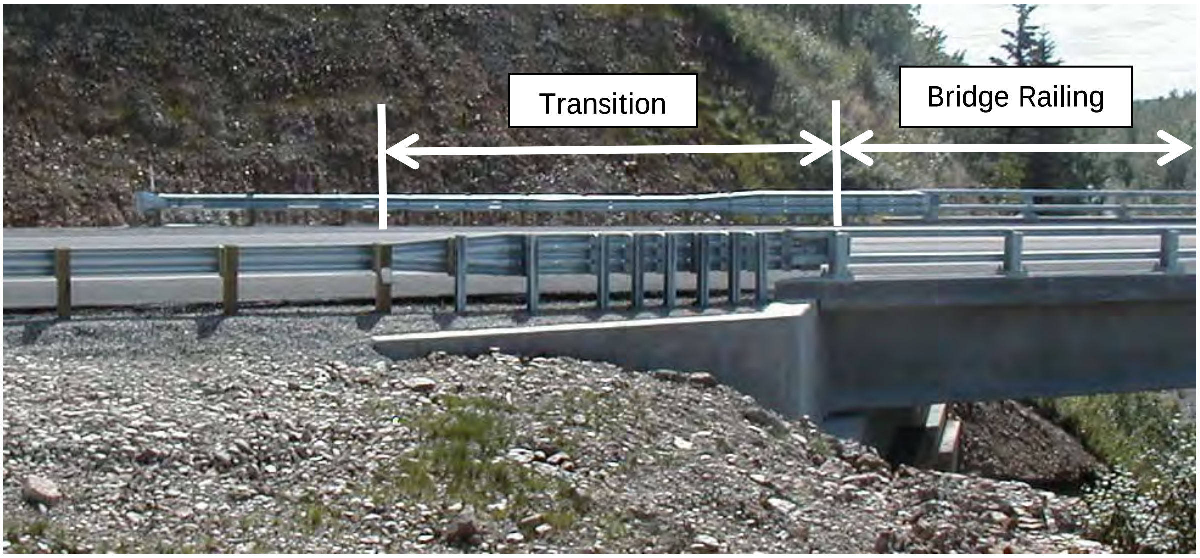


Figure 11. Metal bridge railing and transition. (Source: Alaska DOT)

Bridge carries an NHS route with the following roadside hardware.

Alaska Multi-State Bridge Rail successfully crash-tested for NCHRP 350 Test Level 4.

- Report 3504 for Item B.RH.01 *(Bridge Railings)*.

Alaska Multi-State Bridge Rail Thrie-Beam Transition successfully crash tested for NCHRP 350 Test Level 4.

- Report 3504 for Item B.RH.02 *(Transitions)*.

Examples Continued – Bridge Railings/Transitions

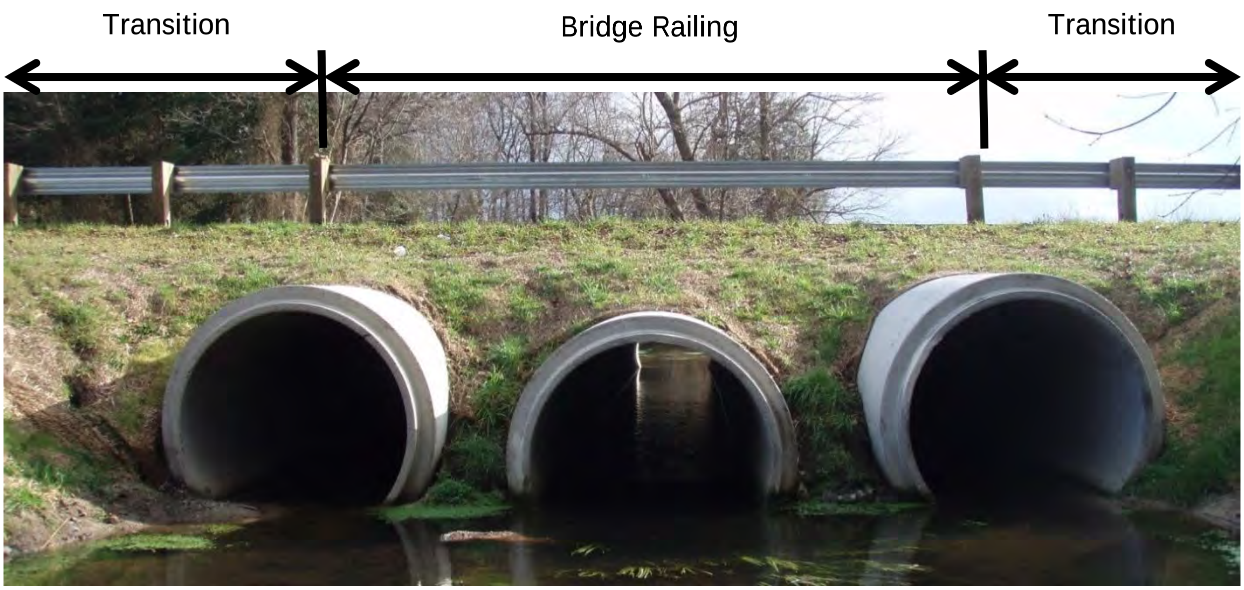


Figure 12. Metal bridge railing and transition for long-span application. (Source: Delaware DOT)

Concrete pipe bridge that carries a non-NHS route with the following roadside hardware.

Steel W-beam bridge rail with wood posts (long-span application) successfully crash tested to MASH 2009 Test Level 3.

- Report M093 for Item B.RH.01 *(Bridge Railings)*.

Steel W-beam transition with wood posts (long-span application) successfully crash tested to MASH 2009 Test Level 3.

- Report M093 for Item B.RH.02 *(Transitions)*.

Example Roadside Hardware Data for Bridge Number 15558X

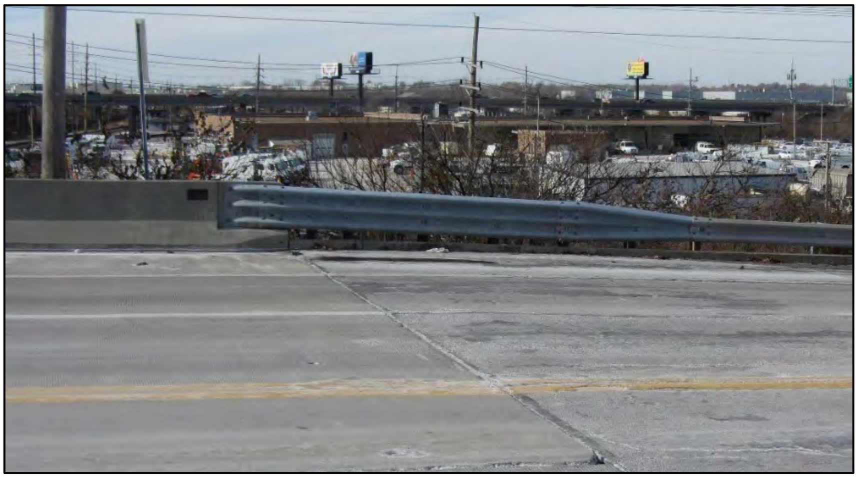


Figure 13. Reinforced concrete bridge railing and metal transition railing for Bridge Number 15558X.

The bridge has a 32" tall New Jersey Concrete Safety Shape bridge railing system with details equivalent to the system that was crash-tested using the 1989 AASHTO Guide Specifications for Bridge Railings that resulted in a PL-2 performance level. This bridge railing system was determined through FHWA memo to have an NCHRP 350 TL-4 equivalency. Report 3504 for Item B.RH.01 *(Bridge Railings)*.

The bridge has a Thrie-Beam transition system for which there is no known information about crash-testing. However, the transition system was built using approved agency standards from 1992. Report S92 for Item B.RH.02 *(Transitions)*.

Table 7. Roadside Hardware. Data items in the Primary Data Set for Bridge Number 15558X.

Item ID	Data Item	Value
B.RH.01	*Bridge Railings*	3504
B.RH.02	*Transitions*	S92

SECTION 3: BRIDGE GEOMETRY

The data items in this section provide geometric data for bridges and are considered part of the Primary Data Set. These data items have a one-to-one relationship with a bridge.

The data for these items typically remain static once a bridge has been inventoried. The following data items are included in this section.

Item ID	**Data Item**
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

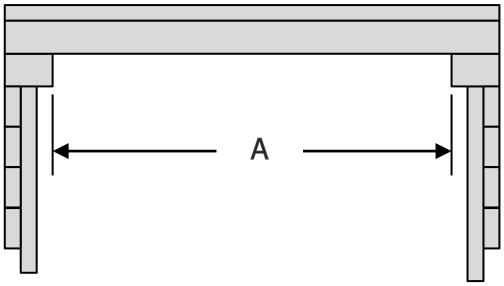
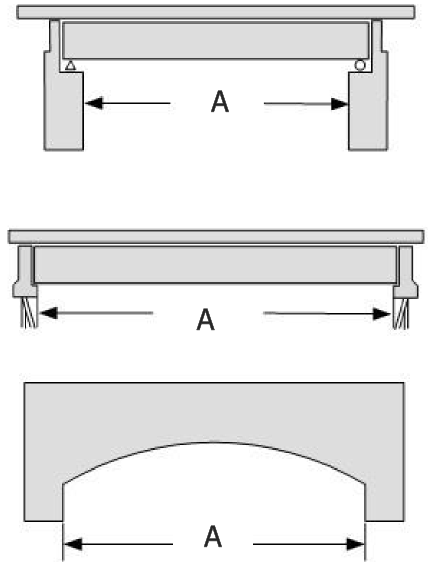
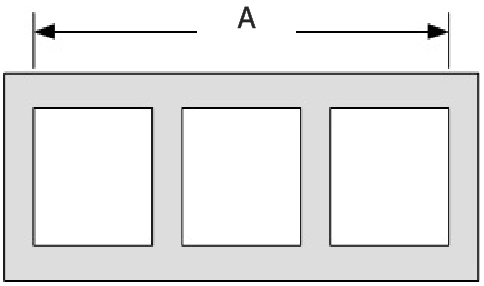
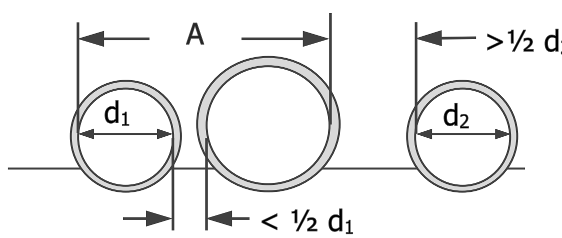
Item B.G.16 *(Calculated Deck Area)* is calculated by FHWA using data from other items in the SNBI. This item is not reported to FHWA. The item specification that explains how the item is calculated is presented for reference only. Therefore, the wording of the specification and commentary is different (passive voice) than for other items (active voice) in this section.

The reported dimensional values for the items in this section can be obtained from either plans or field measurement, excluding B.G.01 *(NBIS Bridge Length),* which is field measured when required by the item specification.

NBIS Bridge Length

Format	Frequency	Item ID
N (7,1)	I	B.G.01

Specification	Commentary
Report the NBIS bridge length to the nearest tenth of a foot measured along the roadway centerline. Measure along the roadway centerline between undercopings of abutments or spring lines of arches. For filled or closed spandrel arches, measure along the roadway centerline from inside faces of exterior spring lines. For other bridges under fill, measure along the roadway centerline from inside faces of exterior walls; this includes multiple pipes, where the clear distance between openings is less than half of the smaller contiguous opening. Vaulted abutments and enclosed spans or sections are included in the NBIS bridge length. Report the field measured NBIS bridge length when Item B.G.02 *(Total Bridge Length)* is less than 30 ft.	NBIS bridge definition: A structure, including supports, erected over a depression or an obstruction, such as water, highway, or railway, and having a track or passageway for carrying traffic or other moving loads, and having an opening measured along the center of the roadway of more than 20 feet between undercopings of abutments or spring lines of arches, or extreme ends of openings for multiple boxes; it includes multiple pipes, where the clear distance between openings is less than half of the smaller contiguous opening. (23 CFR 650.305) Structures that meet the NBIS bridge definition, and NBIS applicability in 23 CFR 650.303, are reported to FHWA. The roadway centerline is the physical center of the portion of the roadway for the movement of vehicles, regardless of striping, and exclusive of shoulders. The length for curved structures would be measured along the curved centerline. When item B.G.02 *(Total Bridge Length)* is greater than 30.0 feet the value for this item may be estimated from plans or drawings, or estimated using the observed difference between items B.G.02 *(Total Bridge Length)* or B.G.03 *(Maximum Span Length)* and the NBIS bridge definition.

Examples – NBIS Bridge Length	
Report measurement A.  Figure 14. Profile view of a single span bridge with pile bent abutments.	Report measurement A.  Figure 15. Profile views of various single span bridges.
Report measurement A.  Figure 16. Profile view of a four-sided, multi-cell culvert under fill.	Report measurement A.  Figure 17. Profile view of a multi-pipe culvert under fill.

Examples Continued – NBIS Bridge Length
Skewed multi-pipe bridge under highway has an opening of 20.85 ft measured along the center of the roadway. Report 20.9.

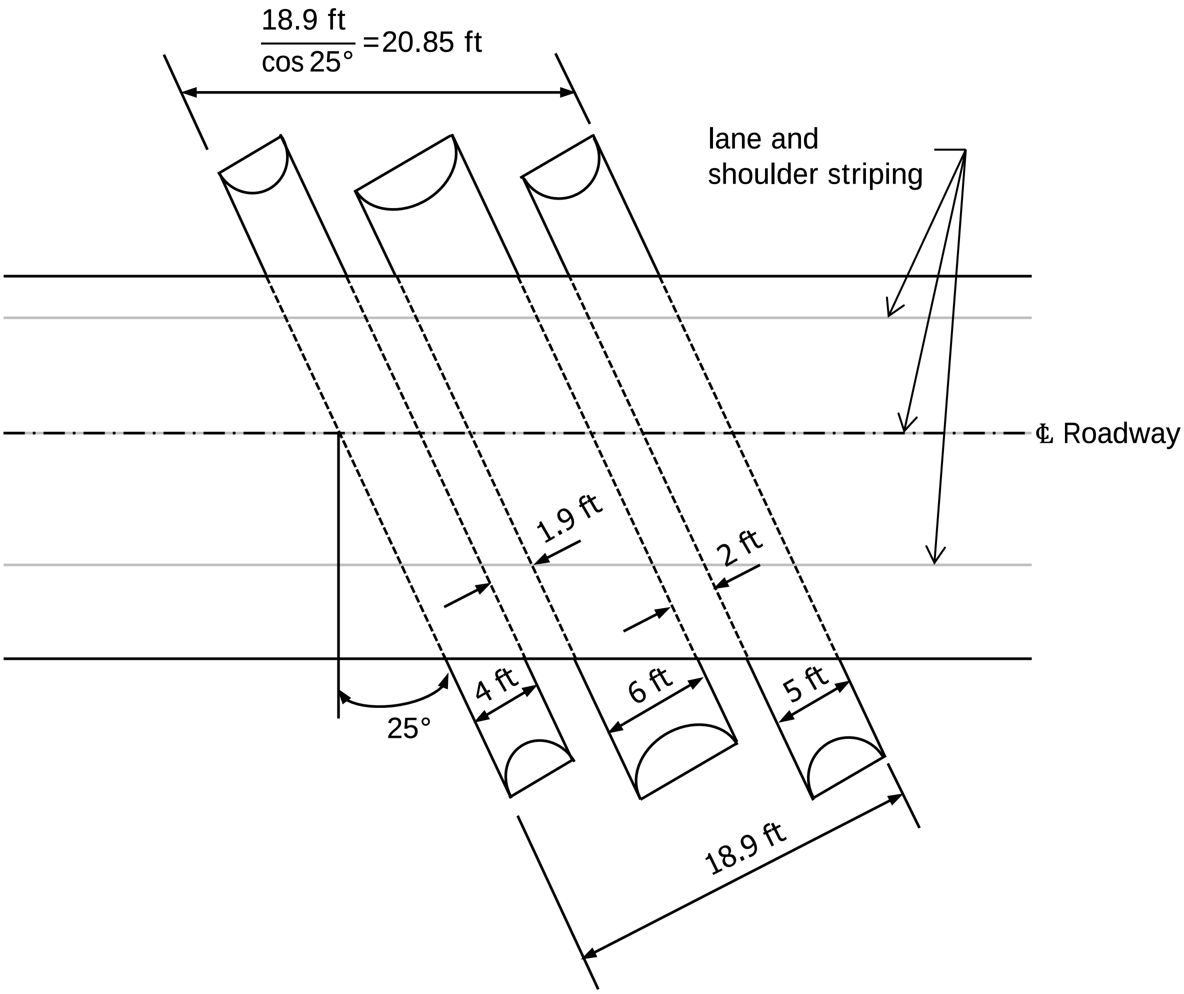


Figure 18. Plan view of a skewed, multi-pipe culvert under fill.

Total Bridge Length

Format	Frequency	Item ID
N (7,1)	I	B.G.02

Specification	Commentary
Report the total length of the bridge to the nearest tenth of a foot measured along the roadway centerline. Measure along the roadway centerline from back-to-back of backwalls or from paving notch to paving notch at abutments. For filled or closed spandrel arches, measure along the roadway centerline from inside faces of exterior spring lines when well-defined backwalls or paving notches do not exist. For other bridges under fill, measure along the roadway centerline from inside faces of exterior walls For bridges with vaulted abutments and enclosed spans or sections, measure from back-to-back of backwalls or from paving notch to paving notch inclusive of the vaulted abutments and enclosed spans.	The total bridge length measurement can be used with the bridge width out-to-out to calculate an estimated deck area. The roadway centerline is the physical center of the portion of the roadway for the movement of vehicles, regardless of striping, and exclusive of shoulders. The total bridge length for curved bridges is measured along the curved centerline.

Examples – Total Bridge Length

Report measurement A.

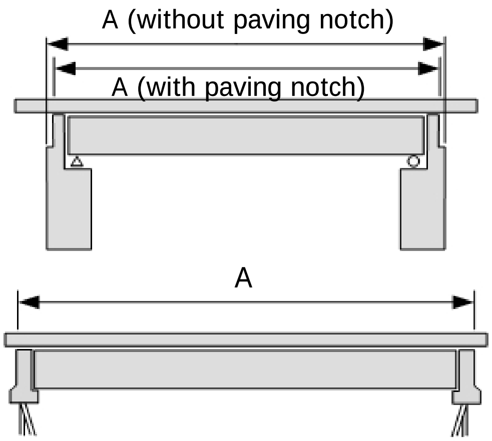


Figure 19. Profile views of various single span bridges.

Report measurement A.

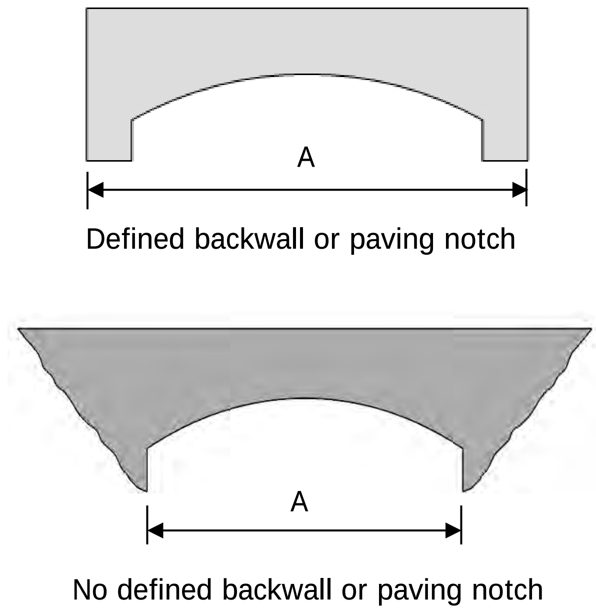


Figure 20. Profile views of various spandrel arches.

Report measurement A.

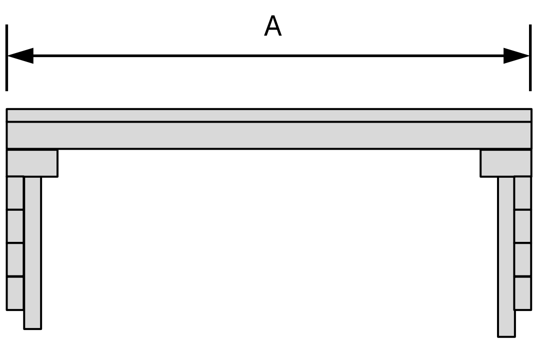
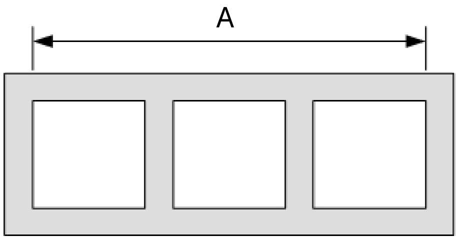
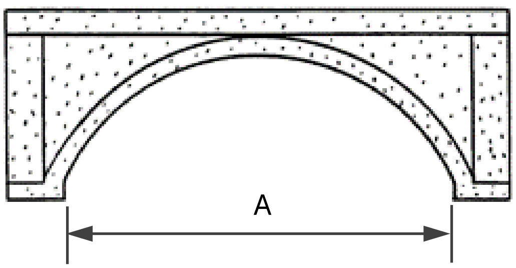
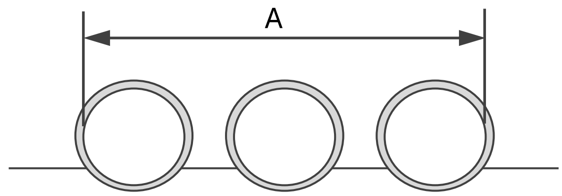
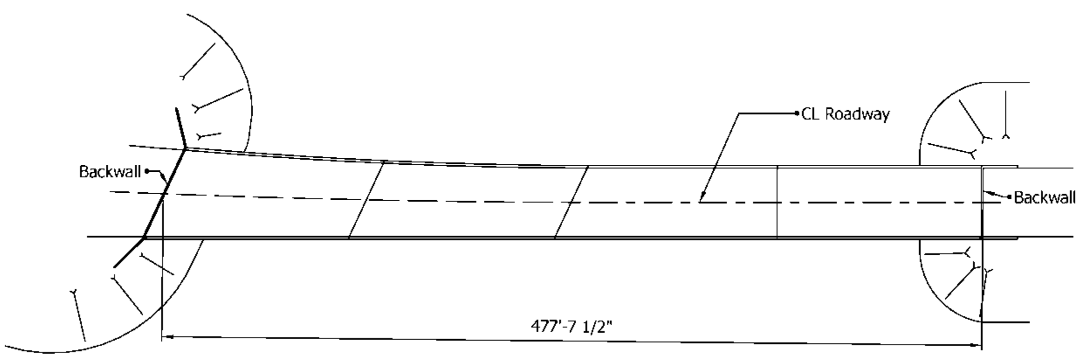
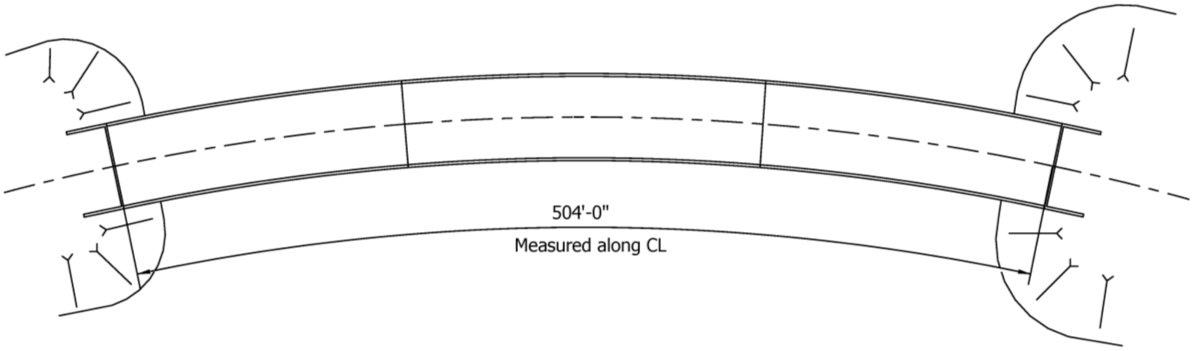
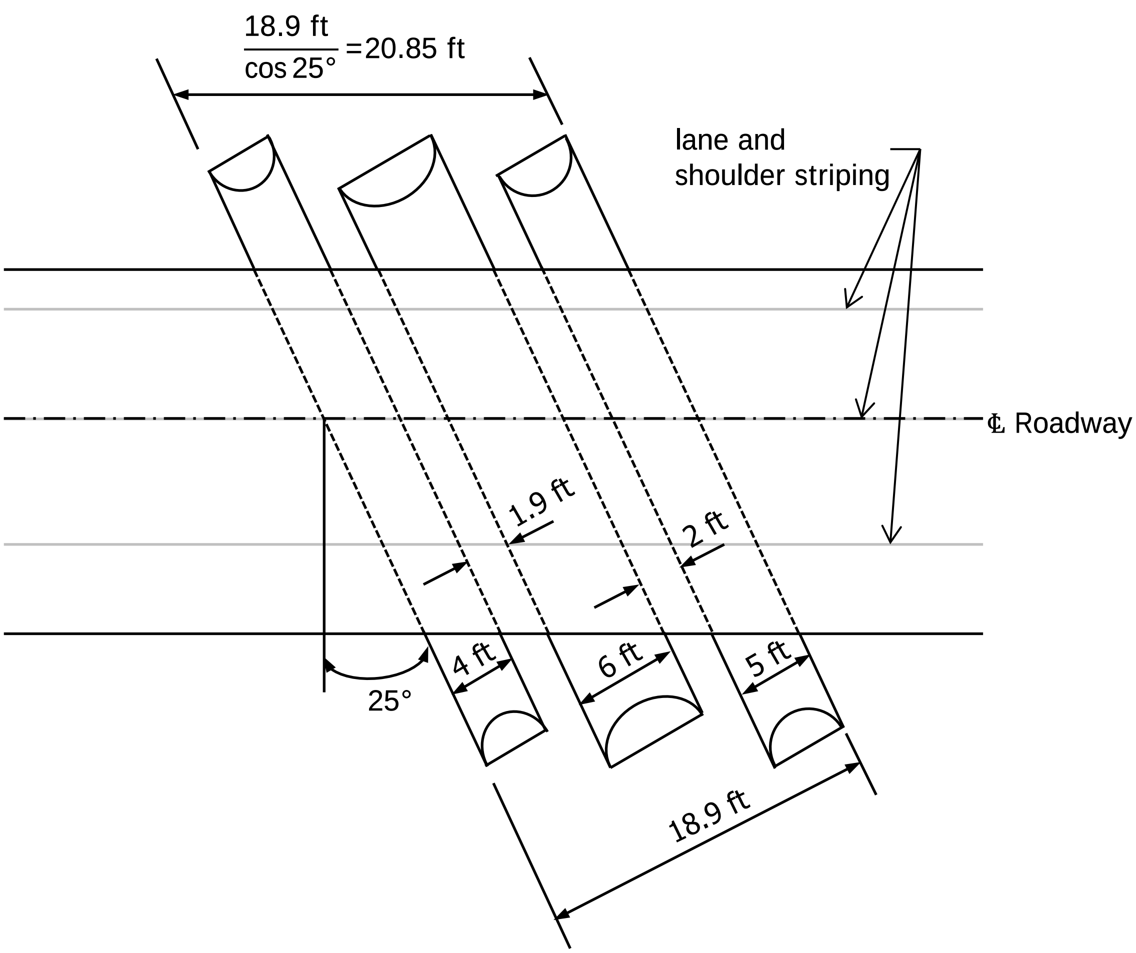


Figure 21. Profile view of a single span bridge with pile bent abutments.

Examples Continued – Total Bridge Length	
Report measurement A.  Figure 22. Profile view of a four-sided, multi-cell culvert under fill.  Figure 23. Profile view of a culvert under fill.	Report measurement A.  Figure 24. Profile view of a multi-pipe culvert under fill.
Four span bridge with variable skews. Total bridge length is measured along the roadway centerline from back-to-back of backwalls at abutments. Report 477.6.  Figure 25. Plan view of a four-span bridge with variable skews.	

Examples Continued – Total Bridge Length
Three span curved bridge. Total bridge length is measured along the roadway centerline from back-to-back of backwalls at abutments. Report 504.0.  Figure 26. Plan view of a three-span curved bridge.
Skewed pipe bridge under a highway has an opening of 20.85 ft measured along the roadway centerline. Report 20.9.  Figure 27. Plan view of a skewed, multi-pipe culvert under fill.

Maximum Span Length

Format	Frequency	Item ID
N (5,1)	I	B.G.03

Specification	Commentary
Report the length of the maximum span to the nearest tenth of foot, measured from centerline of bearing to centerline of bearing, along the roadway centerline.	For rigid frames, arches, pipes, integral abutments, or similar type bridges where there is not a clear centerline of bearing, use the clear open distance between piers, bents, walls, or abutments. The roadway centerline is the physical center of the portion of the roadway for the movement of vehicles, regardless of striping, and exclusive of shoulders. The length for curved bridges would be measured along the curved centerline. For bridges with single spans this item has the same value as B.G.04 *(Minimum Span Length).*

Examples

Report measurement A.

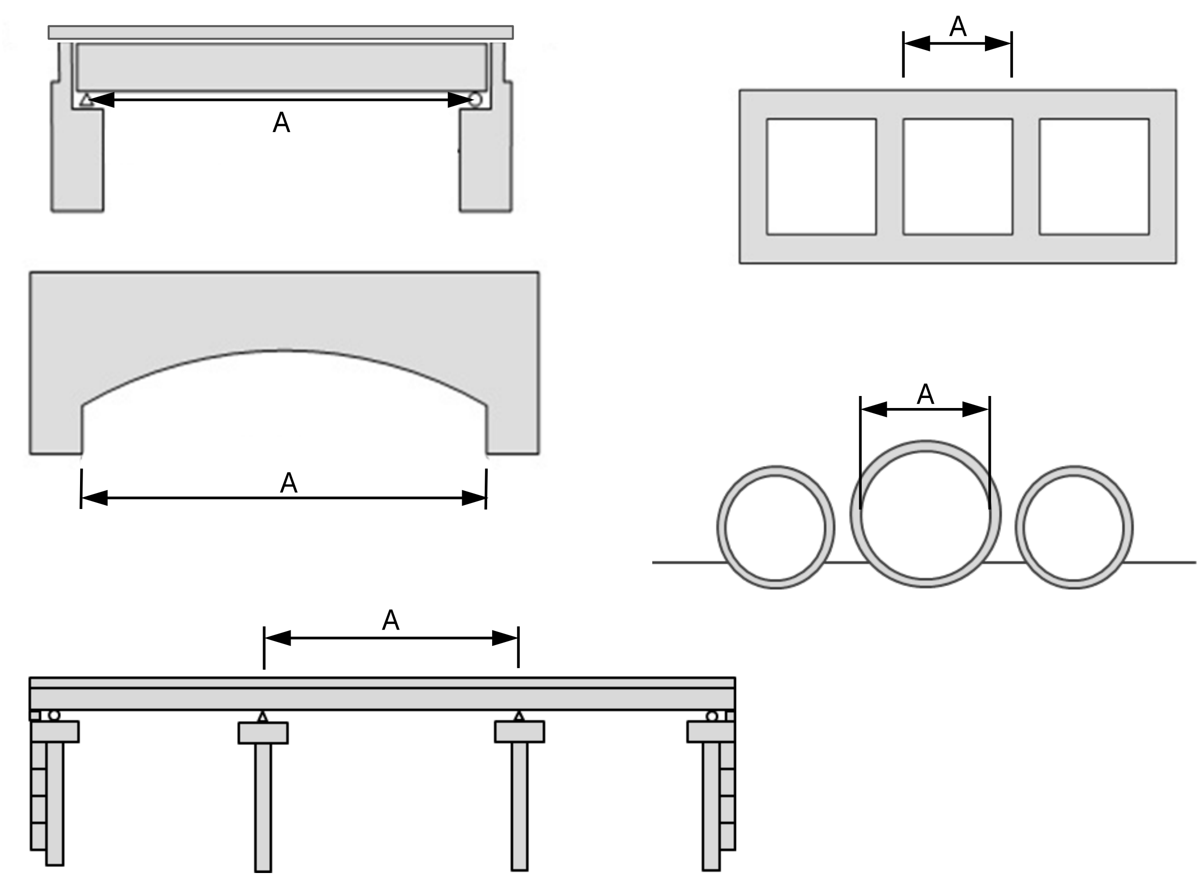
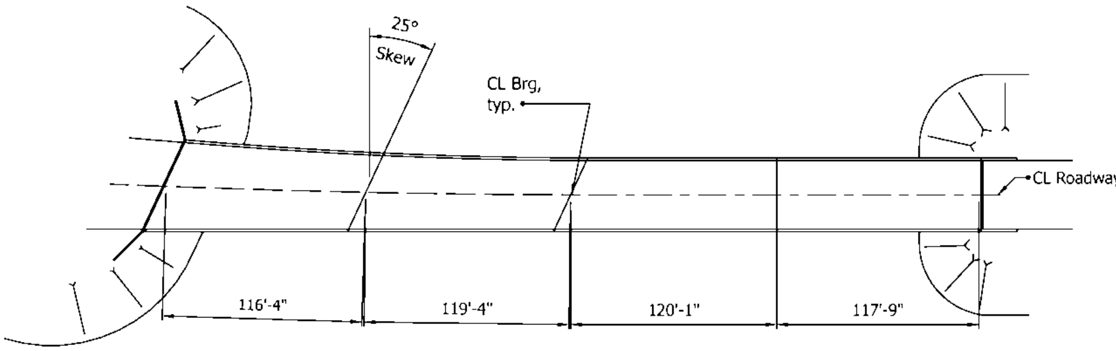
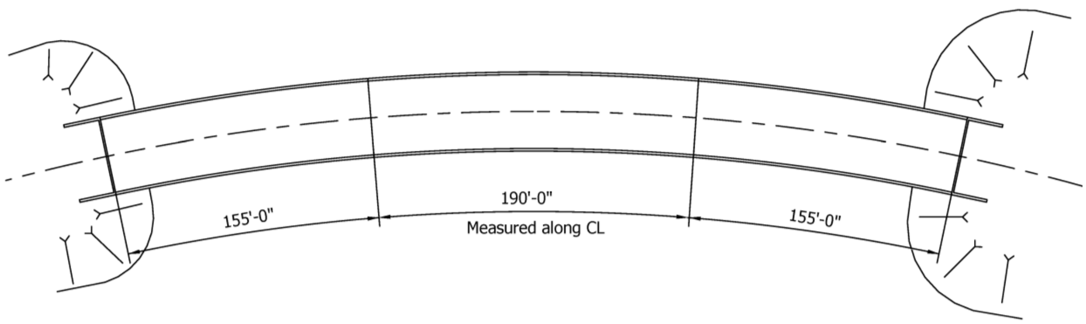


Figure 28. Profile views of various bridge types.

Examples Continued – Maximum Span Length
Four span bridge with variable skews. Span lengths are measured from centerline of bearing to centerline of bearing along the roadway centerline. Report 120.1.  Figure 29. Plan view of a four-span bridge with variable skews.
Three span curved bridge. Span lengths are measured from centerline of bearing to centerline of bearing along the curved roadway centerline. Report 190.0.  Figure 30. Plan view of a three-span curved bridge.

Minimum Span Length

Format	Frequency	Item ID
N (5,1)	I	B.G.04

Specification	Commentary
Report the length of the minimum span to the nearest tenth of foot, measured from centerline of bearing to centerline of bearing, along the roadway centerline.	For rigid frames, arches, pipes, integral abutments, or similar type bridges where there is not a clear centerline of bearing, use the clear open distance between piers, bents, or abutments.

Commentary Continued

The roadway centerline is the physical center of the portion of the roadway for the movement of vehicles, regardless of striping, and exclusive of shoulders. The length for curved bridges is measured along the curved centerline.

For bridges with single spans this item has the same value as B.G.03 *(Maximum Span Length)*.

Examples

Report measurement A.

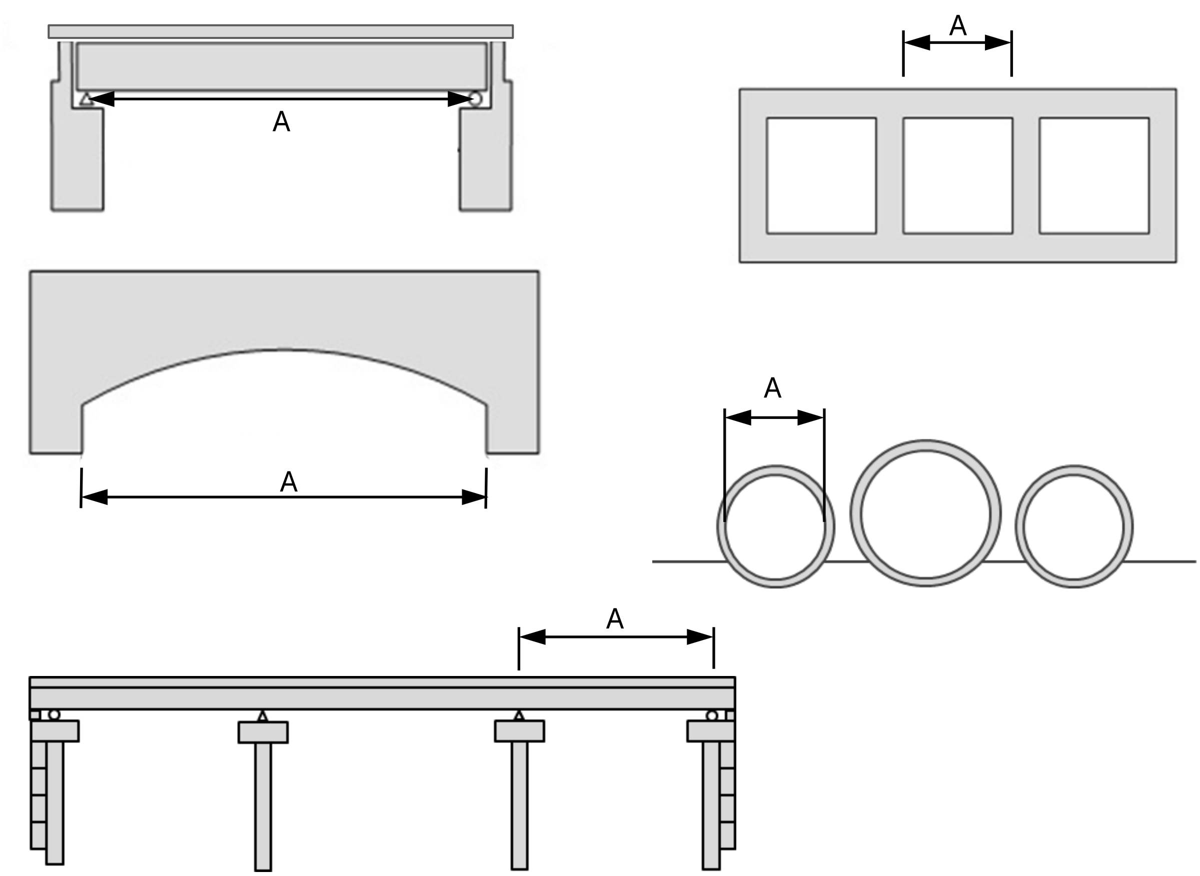
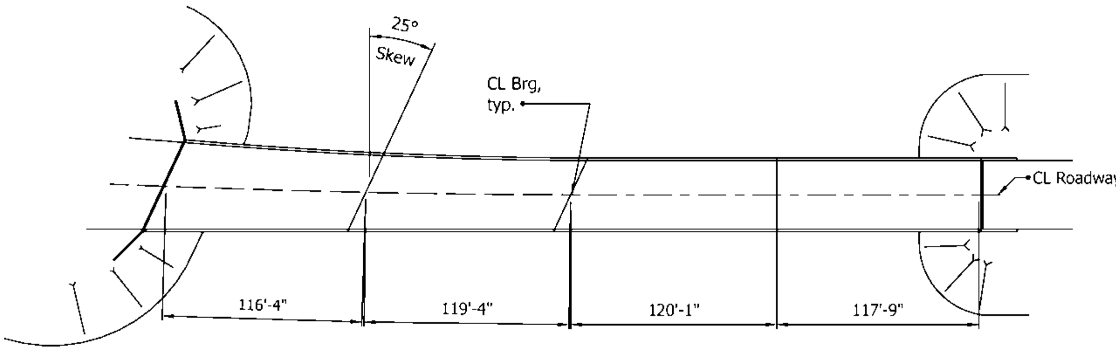
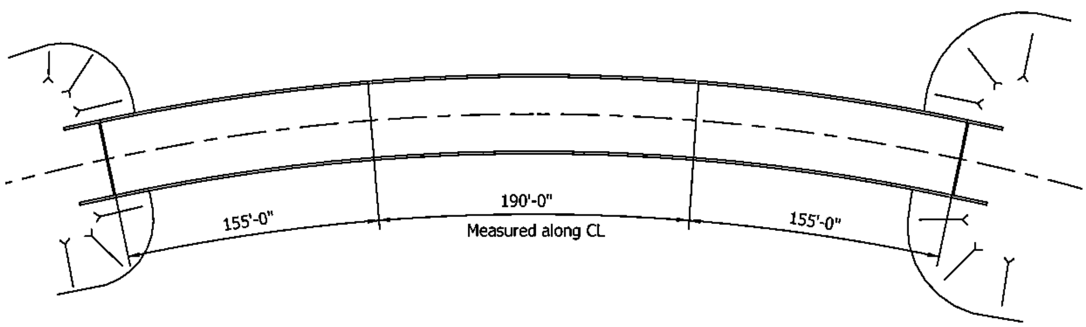


Figure 31. Profile views of various bridge types.

Examples Continued – Minimum Span Length
Four span bridge with variable skews. Span lengths are measured from centerline of bearing to centerline of bearing along the roadway centerline. Report 116.3.  Figure 32. Plan view of a four-span bridge with variable skews.
Three span curved bridge. Span lengths are measured from centerline of bearing to centerline of bearing along the curved roadway centerline. Report 155.0.  Figure 33. Plan view of a three-span curved bridge.

Bridge Width Out-to-Out

Format	Frequency	Item ID
N (4,1)	I	B.G.05

Specification	Commentary
Report the minimum out-to-out width measured perpendicular to the centerline of the roadway to the nearest tenth of a foot. For multiple (double) deck bridges that are inventoried as one bridge, measure all levels, and report the sum of the measurements to account for the total width carried on the bridge. For bridges under fill, measure the width from out-to-out of the headwalls or barrel ends. For sidehill bridges, measure the out-to-out structure width. For bridges that carry multiple types of service, for example highway, pedestrian, and railroad, measure the out-to-out width that encompasses all service types.	For bridges under fill, the reported value can be limited to the width of the roadway section over the bridge for unusual situations where the bridge continues far beyond the roadway cross-section, and a lesser width would likely be constructed for a replacement project. For bridges under fill, in which the features that define the out-to-out width are not parallel, report the minimum out-to-out width.

Examples

Report measurement A.

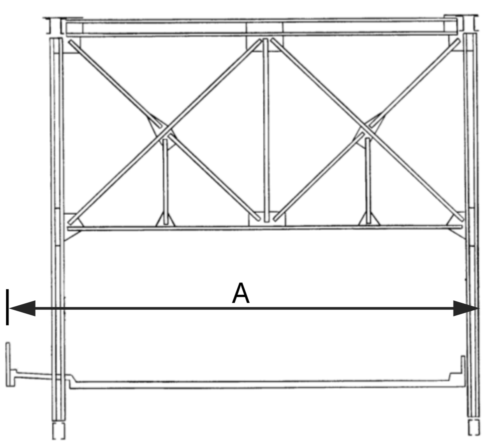
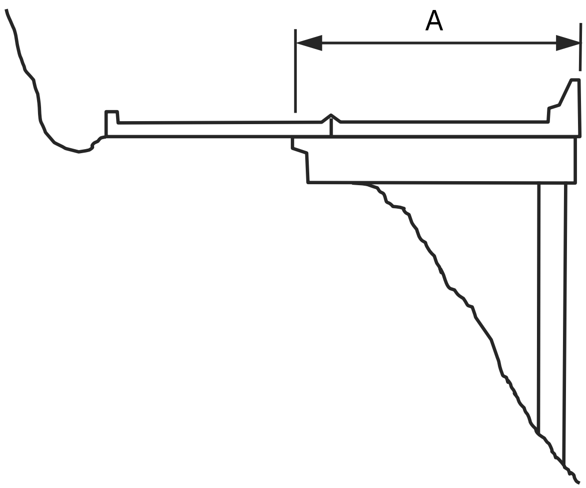
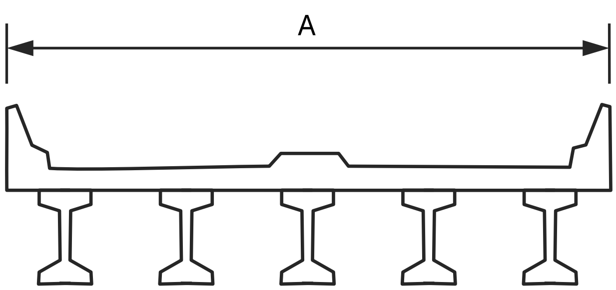
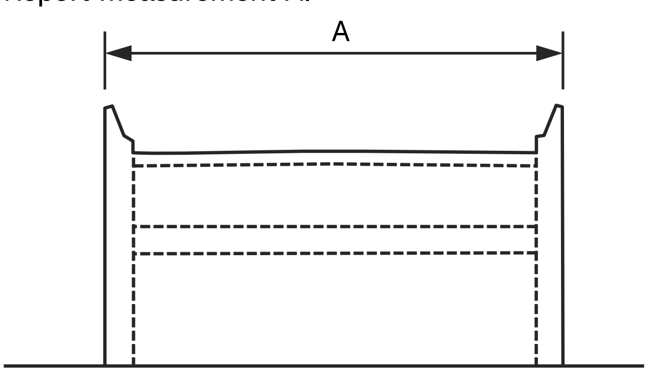
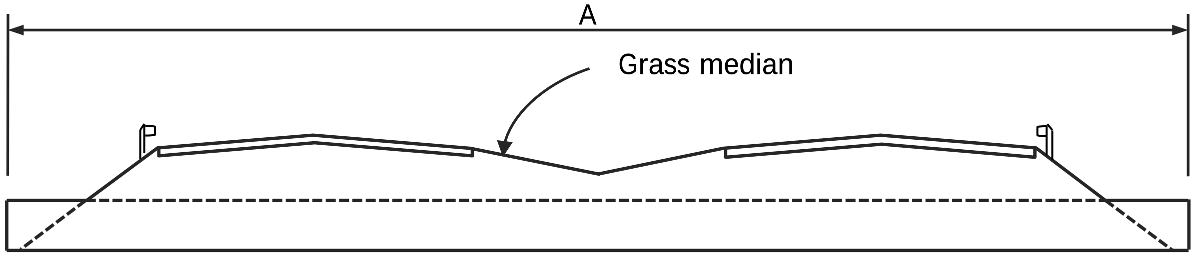
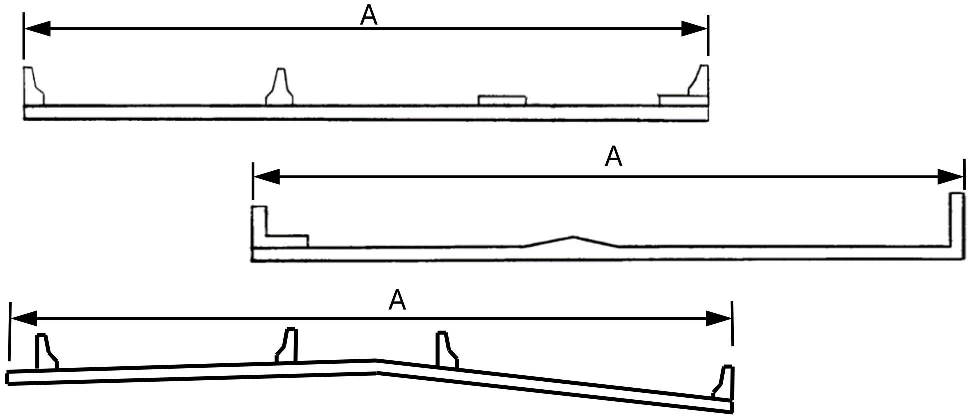
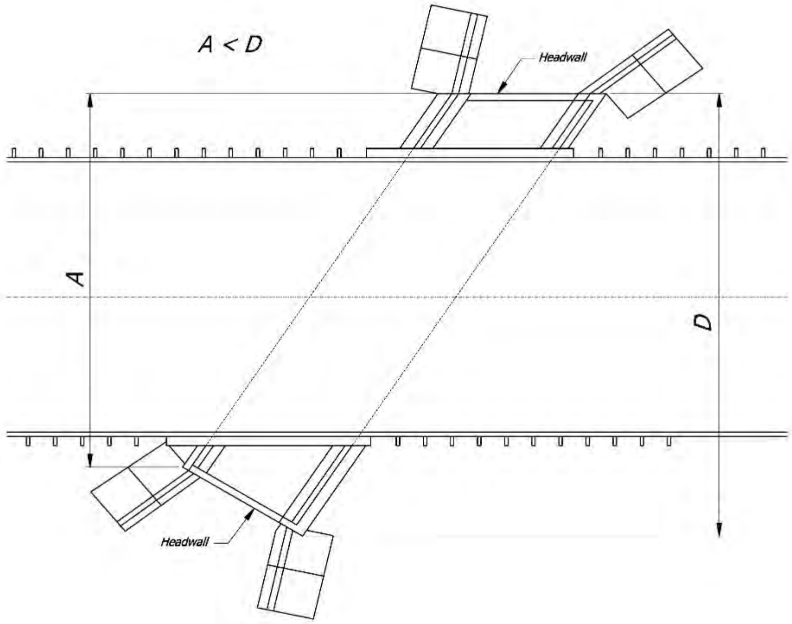
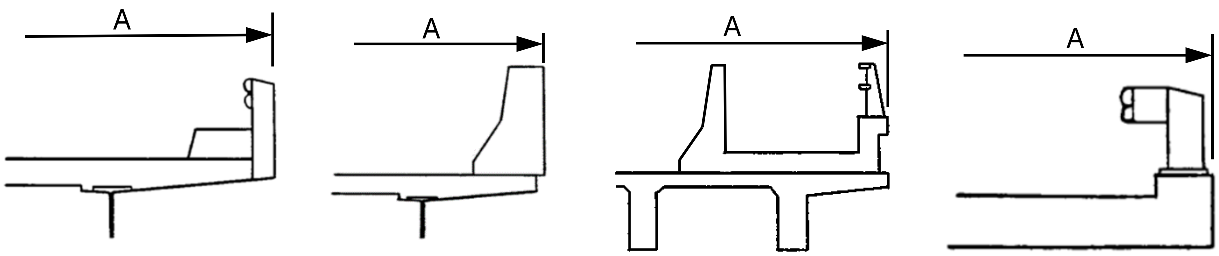
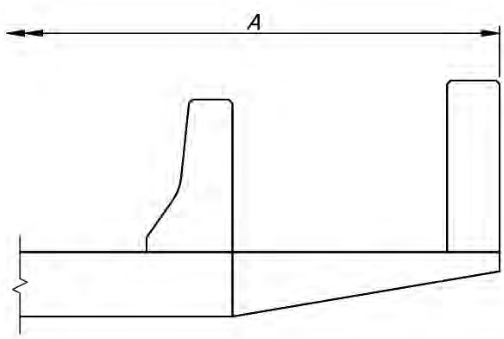


Figure 34. Cross-section view of a through truss bridge.

Examples Continued – Bridge Width Out-to-Out
Report measurement A.  Figure 35. Cross-section view of a sidehill bridge.
Report measurement A.  Figure 36. Cross-section view of a multi-girder bridge.
Report measurement A.  Figure 37. Cross-section view of a filled arch bridge or culvert under fill with headwalls.

Examples Continued – Bridge Width Out-to-Out
Report measurement A.  Figure 38. Cross-section view of a pipe culvert under fill.
Report measurement A.  Figure 39. Cross-section views of various bridge decks with medians.
Report measurement A.  Figure 40. Plan view of a bridge with non-parallel fascias.

Examples Continued – Bridge Width Out-to-Out
Report measurement A.  Figure 41. Partial cross-section views of various bridge decks with railings.
Report measurement A.  Figure 42. Cross-section view of a sidewalk retrofit.

Bridge Width Curb-to-Curb

Format	Frequency	Item ID
N (4,1)	I	B.G.06

Specification	Commentary
Report the sum of the most restrictive minimum usable distances for all roadways carried by the bridge. Measure the distance on the bridge perpendicular to the centerline of the roadway between curbs or rails to the nearest tenth of a foot. Exclude from the usable distance measurement medians, sidewalks, structurally inadequate shoulders, and other non-mountable areas. The measurement for this item shall be compatible with the measurements used for Item B.H.08 *(Lanes On Highway)*, Item B.G.09 *(Approach Roadway Width)*, and Item B.H.09 *(Annual Average Daily Traffic)*. For multiple (double) deck bridges that are inventoried as one bridge, measure all levels, and report the sum of the most restrictive minimum usable distances carried by the bridge. For sidehill bridges measure the actual full curb-to-curb roadway width. For bridges that carry multiple types of service, for example highway, pedestrian, and railroad, report the usable distance that serves the highway service as denoted by curb or barrier separation, or other delineation that separates the service types.	Usable roadway width includes the width of traffic lanes and the widths of shoulders. Shoulders must be contiguous with the traveled way and must be structurally adequate for all weather and traffic conditions consistent with the facility carried. Unstabilized grass or dirt, with no base course, flush with and beside the traffic lane is not to be considered a shoulder for this item. Refer to agency policy for when and where stabilized shoulders are used. When it is not readily known if stabilized construction details were used, the presence of rutting, heaving, water retention, or other distress may be used as indicators that the shoulder is not stabilized. For bridges under fill, the usable roadway width crossing the bridge is commonly the same value reported for Item B.G.09 *(Approach Roadway Width)*. A barrier or curb greater than 6 inches high may be considered non-mountable for these specifications.

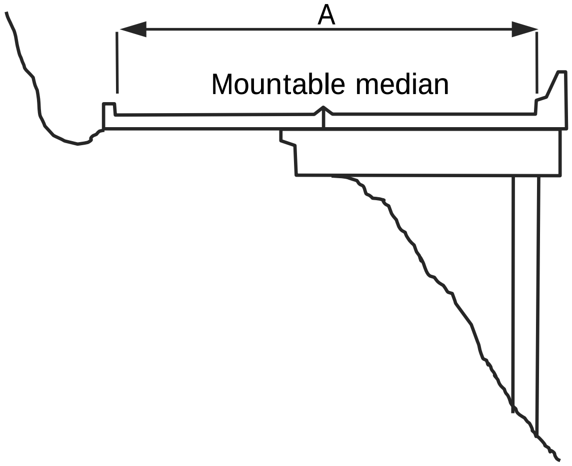
<table>
<tr><th colspan="2">Examples – Bridge Width Curb-to-Curb</th></tr>
<tr>
<td>Report measurement A.


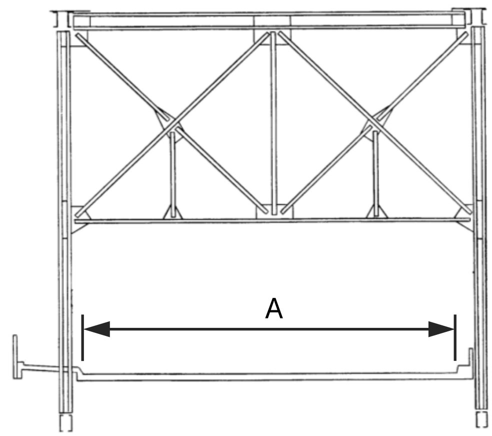
Figure 43. Cross-section view of a sidehill bridge.</td>
<td>Report measurement A.


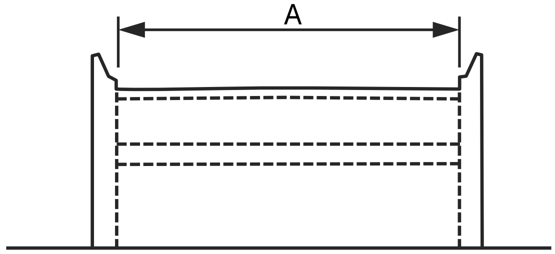
Figure 44. Cross-section view of a through truss bridge.</td>
</tr>
<tr>
<td>Report measurement A.


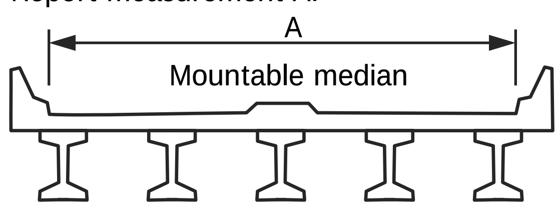
Figure 45. Cross-section view of a filled arch bridge or culvert under fill with headwalls.</td>
<td>Report measurement A.


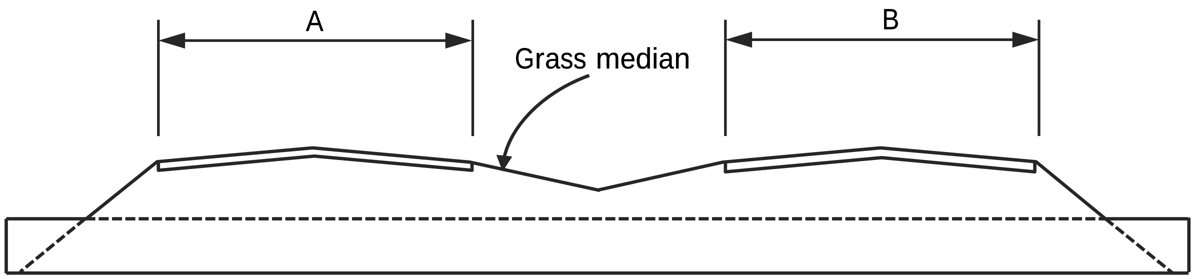
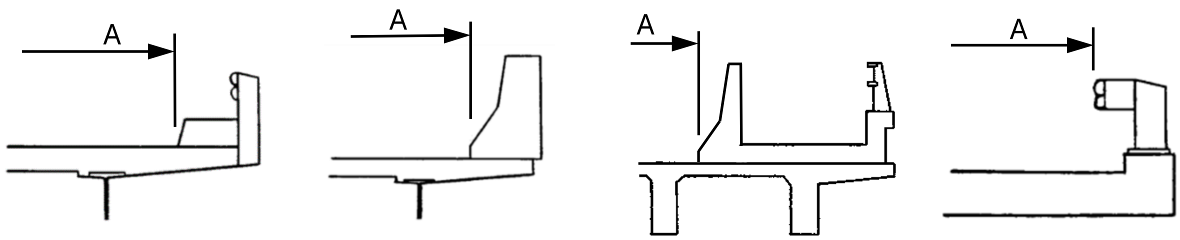
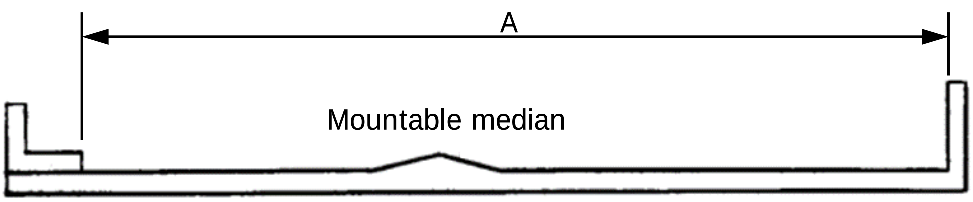
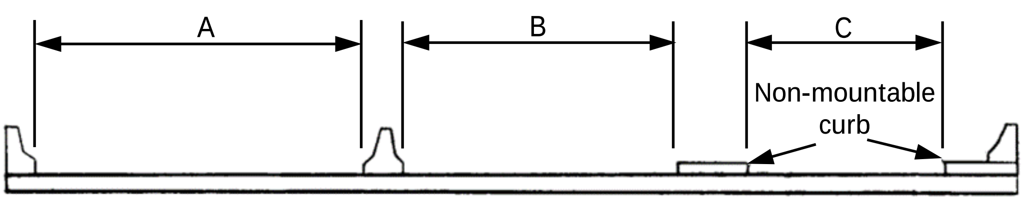
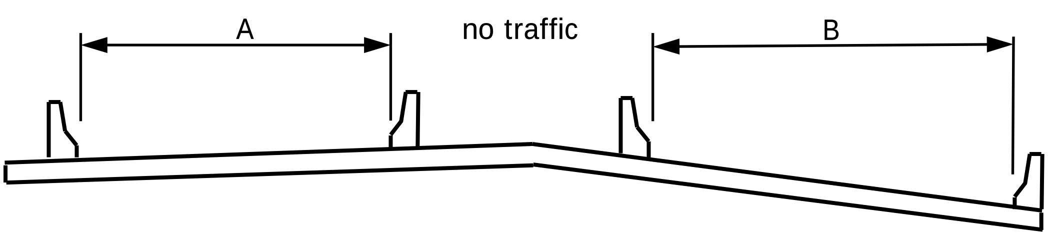
Figure 46. Cross-section view of a multi-girder bridge.</td>
</tr>
<tr>
<td colspan="2">Report the sum of A+B.


Figure 47. Cross-section view of a pipe culvert under fill.</td>
</tr>
</table>

Examples Continued – Bridge Width Curb-to-Curb
Report measurement A.  Figure 48. Partial cross-section views of various bridge decks with railings.
Report measurement A.  Figure 49. Cross-section view of a bridge deck with mountable median.
Report the sum of A+B+C.  Figure 50. Cross-section view of a bridge deck with non-mountable curb and median barrier.
Report the sum of A+B.  Figure 51. Cross-section view of a bridge deck with multiple median barriers.

Left Curb or Sidewalk Width

Format	Frequency	Item ID
N (3,1)	I	B.G.07

Specification	Commentary
Report the minimum width of the left curb or sidewalk to the nearest tenth of a foot from the face of bridge rail to the face of curb. Measure the width perpendicular to the centerline of the roadway. Report 0.0 when the face of the curb does not extend beyond the face of the bridge rail. Report 0.0 when there is no left curb or sidewalk.	Left and right are determined based on the direction of the inventoried route carried by the bridge, commonly west to east or south to north. When a defined longitudinal joint exists between the curb and the sidewalk, such as a granite curb and concrete sidewalk, measure the width from the face of bridge rail to the face of the granite curb.

Examples

Report measurement C.

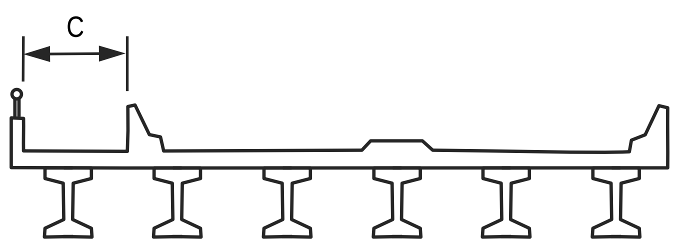


Figure 52. Cross-section view of a multi-girder bridge.

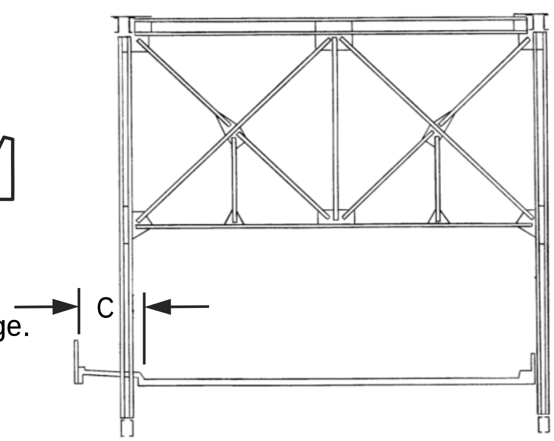


Figure 53. Cross-section view of a through truss bridge.

Report measurement C.

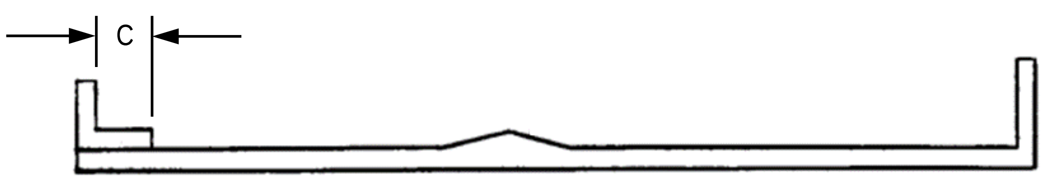
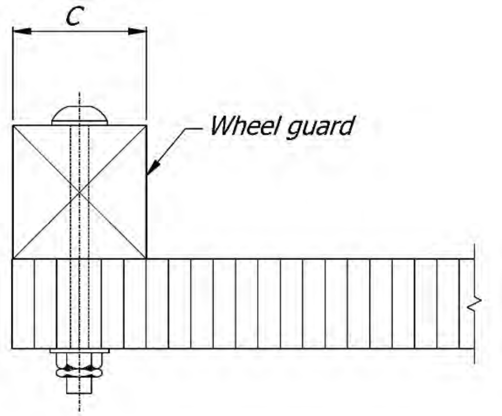
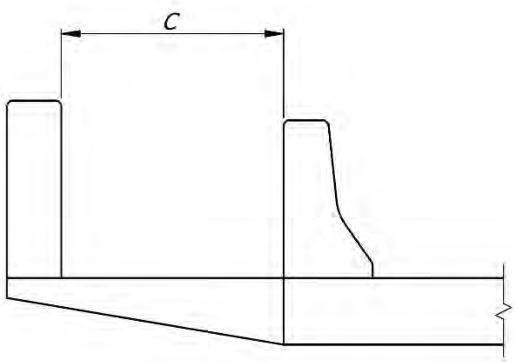
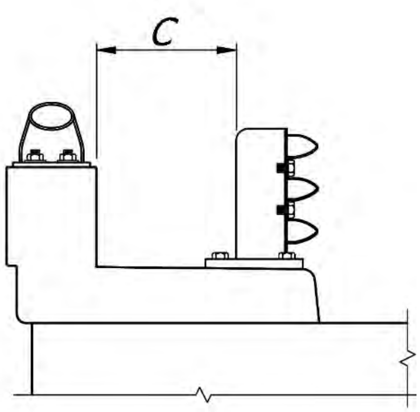


Figure 54. Cross-section view of a slab bridge.

Examples Continued – Left Curb or Sidewalk Width
Report measurement C.  Figure 55. Cross-section view of a timber wheel guard.
Report measurement C.  Figure 56. Cross-section view of a sidewalk retrofit.
Report measurement C.  Figure 57. Cross-section view of a sidewalk retrofit.

Right Curb or Sidewalk Width

Format	Frequency	Item ID
N (3,1)	I	B.G.08

Specification	Commentary
Report the minimum width of the right curb or sidewalk to the nearest tenth of a foot from the face of bridge rail to the face of curb. Measure the width perpendicular to the centerline of the roadway. Report 0.0 when the face of the curb does not extend beyond the face of the bridge rail. Report 0.0 when there is no right curb or sidewalk.	Right and left is determined based on the direction of the inventoried route carried by the bridge, commonly west to east or south to north. When a defined longitudinal joint exists between the curb and the sidewalk, such as a granite curb and concrete sidewalk, measure the width from the face of bridge rail to the face of the granite curb.

Examples

Report measurement C.

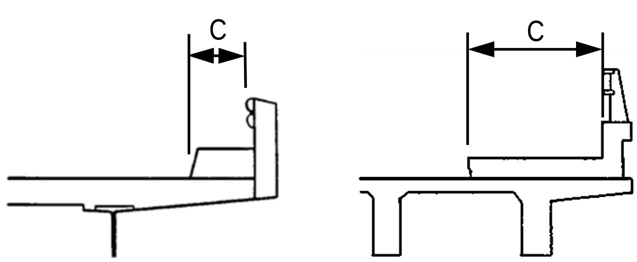


Figure 58. Partial cross-section views of various bridge decks with railings.

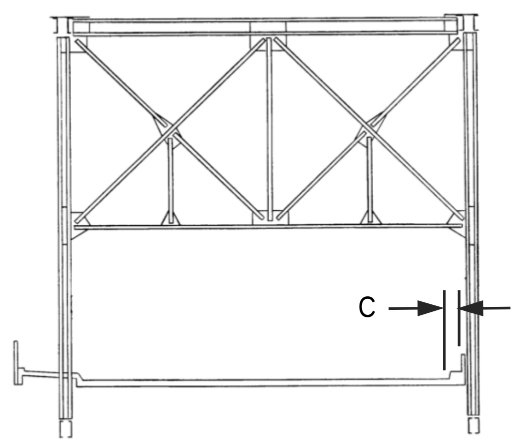


Figure 59. Cross-section view of a through truss bridge.

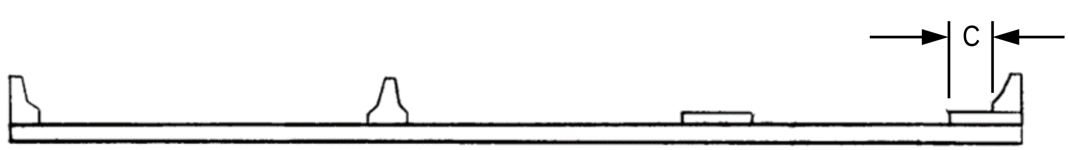
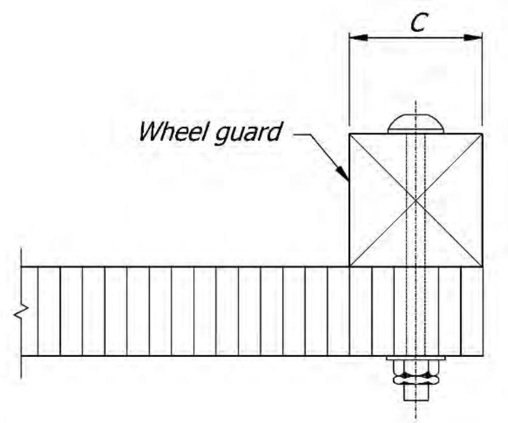
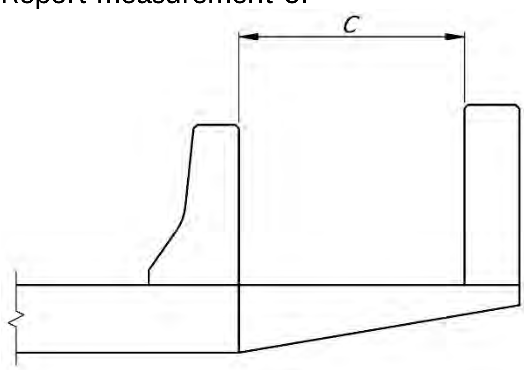
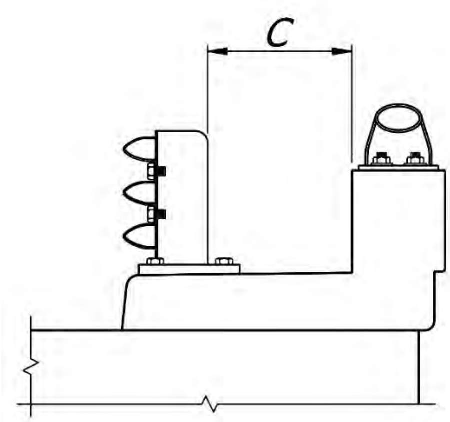


Figure 60. Cross-section view of a slab bridge with various medians.

Examples Continued – Right Curb or Sidewalk Width
Report measurement C.  Figure 61. Cross-section view of a timber wheel guard.
Report measurement C.  Figure 62. Cross-section view of a sidewalk retrofit.
Report measurement C.  Figure 63. Cross-section view of a sidewalk retrofit.

Approach Roadway Width

Format	Frequency	Item ID
N (4,1)	I	B.G.09

Specification	Commentary
Report the minimum usable approach roadway width measured to the nearest tenth of a foot. Measure the distance perpendicular to the centerline of the roadway between curbs or rails that is representative of the approach roadway within 100 feet of the bridge. Exclude from the usable distance measurement: medians, sidewalks, and other protected areas with non-mountable curbs or barriers. Report the lesser of the two approach roadway widths for bridges that carry two-way traffic. Report the width at the approach end for bridges that carry one-way traffic.	Usable roadway width includes the width of traffic lanes and the width of shoulders. Shoulders must be contiguous with the traveled way and must be structurally adequate for all weather and traffic conditions consistent with the facility carried. Unstabilized grass or dirt, with no base course, flush with and beside the traffic lane is not to be considered a shoulder for this item. Refer to agency policy for when and where stabilized shoulders are used. When it is not readily known if stabilized construction details were used, the presence of rutting, heaving, water retention, or other distress may be used as indicators that the shoulder is not stabilized. A curb greater than 6 inches high may be considered non-mountable for these specifications.

Examples

Both roadways are carried on one bridge. Report the sum of measurements A and B.

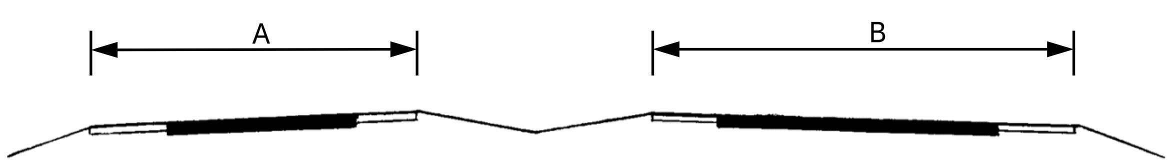
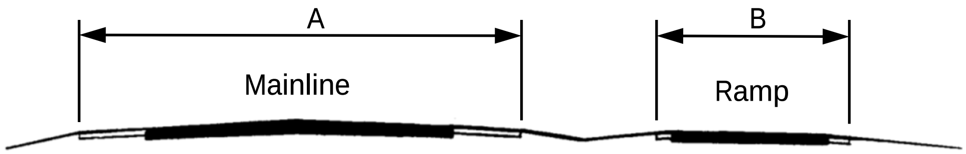
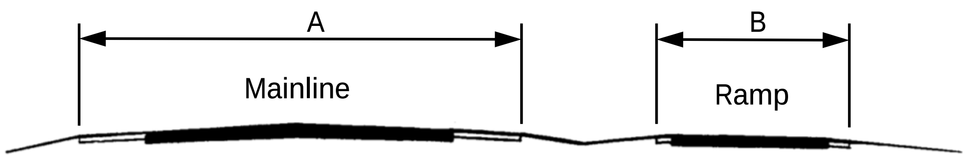


Figure 64. Cross-section view of two approach roadways that are carried across one bridge.

Examples Continued – Approach Roadway Width
Mainline and Ramp are both carried on one bridge. Report the sum of measurements A and B.  Figure 65. Approach roadway cross-section view for a mainline and a ramp that are carried across one bridge.
Mainline and Ramp are carried on separate bridges. • Report measurement A for the Mainline bridge. • Report measurement B for the Ramp bridge.  Figure 66. Approach roadway cross-section view for a mainline and a ramp that are carried across separate bridges.

Bridge Median

Format	Frequency	Item ID
AN (1)	I	B.G.10

Specification	Commentary
Report the type of bridge median using one of the following codes.	A barrier or curb greater than 6 inches high may be considered non-mountable for these specifications. For bridges with a longitudinal joint, use code 1 when traffic cannot safely traverse the joint width. If the joint width is safely traversable, use one of the remaining codes. Joint condition does not affect the coding of this item.

Code	Description
0	No median
1	Open median
2	Closed median (mountable)
3	Closed median (non-mountable)

Commentary Continued

Use code 0 for bridges that do not have a median, including bridges that carry adjacent traffic lanes separated only by centerline, edge line, or channelization striping, with or without a traversable longitudinal joint.

Use code 2 for bridges with medians that are either flush or mountable, with or without a traversable longitudinal joint, including areas that are striped to designate a median.

Examples

Each example represents a single bridge.

Report 1.

Open median

Figure 67. Cross-section view of a bridge deck with open median.

Report 2.

Closed median (mountable)

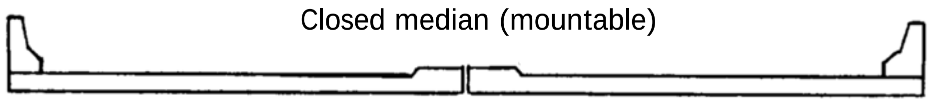


Figure 68. Cross-section view of a bridge deck with closed median (mountable)

Report 3.

Closed Median (non-mountable)

Figure 69. Cross-section view of a bridge deck with closed median (non-mountable).

Skew		
Format N (2,0)	Frequency I	Item ID B.G.11

Specification	Commentary
Report the skew angle to the nearest degree. Measure the skew angle between the centerline of a substructure unit and a line perpendicular to the roadway centerline. Report the maximum skew when skews vary amongst substructure units. Report 0 if there is no skew.	The skew angle can be taken directly from the plans, if available, or measured in the field.

Example

Report the skew as the result of $\mathrm{Sin}^{-1}(A/C)$, $\mathrm{Cos}^{-1}(B/C)$ or $\mathrm{Tan}^{-1}(A/B)$.

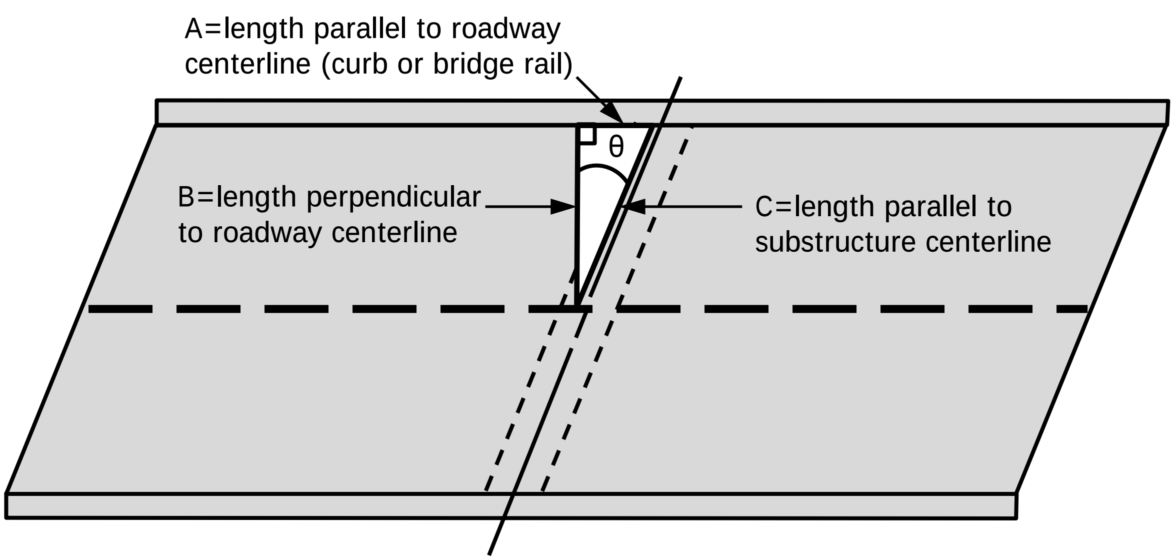


Figure 70. Plan view of a bridge deck indicating skew determination.

Curved Bridge

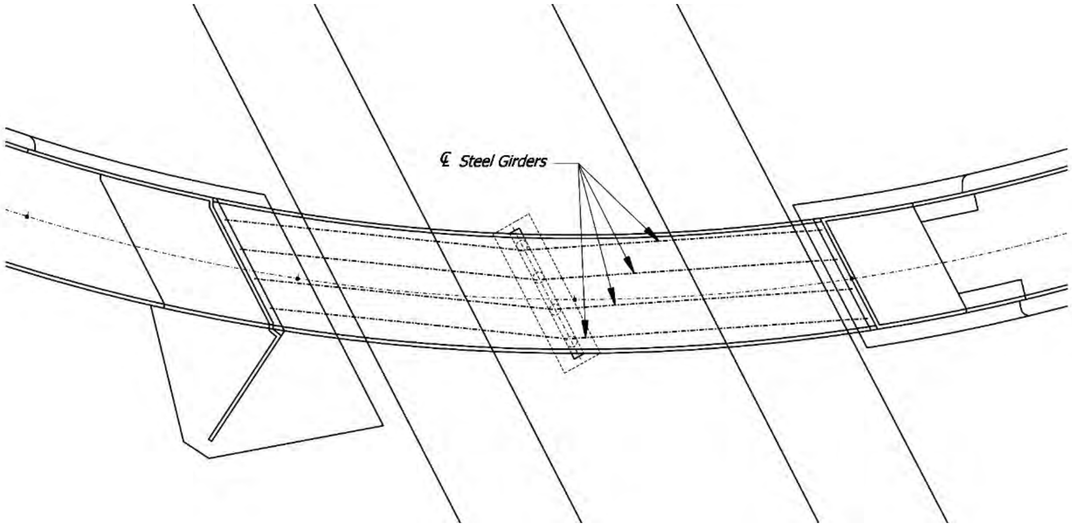
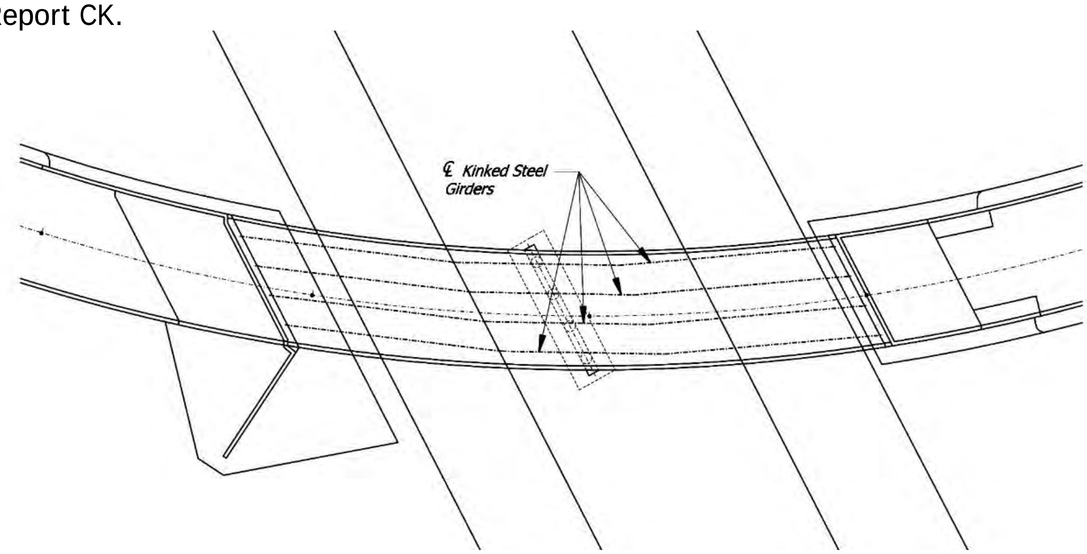
Format	Frequency	Item ID
AN (2)	I	B.G.12

Specification	Commentary
Report whether the bridge is horizontally curved using one of the following codes. Code Description CU Curved girder(s) CP Piecewise straight girders CK Kinked girder(s) N Not curved	A bridge is considered horizontally curved when at least one girder line forms a curve using either a curved girder(s), piecewise straight girders forming a segmented/chorded curve, or a kinked girder(s). For this specification, a piecewise straight girder line is comprised of girders with a longitudinal axis that changes orientation at one or more supports. The girder line may be simply supported or continuous at supports. A kinked girder is 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. Use code N for bridges that have curved deck geometry, or may be striped as curved, but the girders do not form a curve.

Example

Report CU.

Figure 71. Curved bridge with curved girders. (Source: Alaska DOT)

Examples Continued – Curved Bridge
Report CP.  Figure 72. Plan view of a curved bridge with piecewise straight girders.
Report CK.  Figure 73. Plan view of a curved bridge with kinked girders.

Maximum Bridge Height

Format	Frequency	Item ID
N (4,0)	I	B.G.13

Specification	Commentary
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.	For double-deck bridges inventoried as one bridge, measure from top of deck of the lower deck. For double-deck bridges inventoried as two bridges, measure from the top of deck of the inventoried bridge. Ground line represents dry terrain, pavement, or waterway bottom. Use the water surface elevation at the time the value for this item is established. This item 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. This item does not need to be updated due to fluctuations in water surface elevation.

Example

Bridge carries SR170 over Felix Creek and County Trail. Report 27.

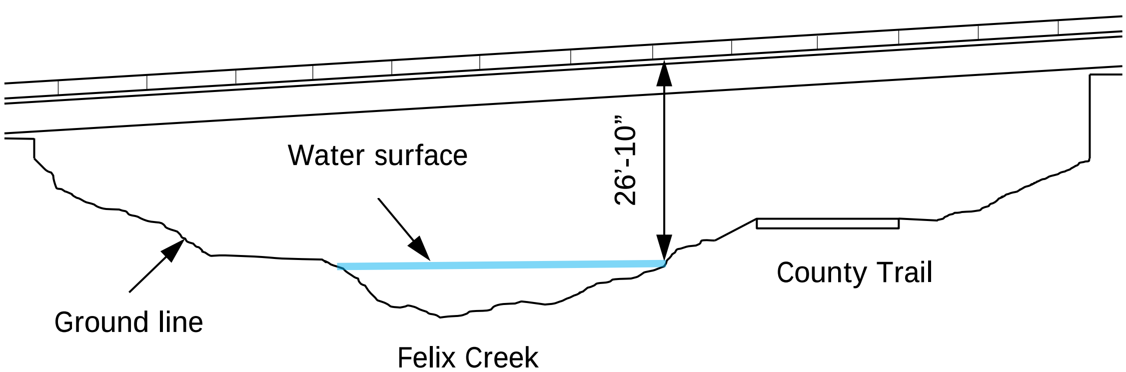


Figure 74. Profile view of a bridge over a creek and trail.

Sidehill Bridge

Format	Frequency	Item ID
AN (1)	I	B.G.14

Specification	Commentary
Report whether any portion of the bridge is a sidehill structure. Code / Description N — Not a sidehill bridge Y — Is a sidehill bridge	A sidehill bridge is 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. The 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. For sidehill bridges, 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. Use code N when no portion of the bridge is a sidehill structure.

Example

A bridge is built onto the side of a hill with the roadway partially on ground and partially on structure. Report Y.

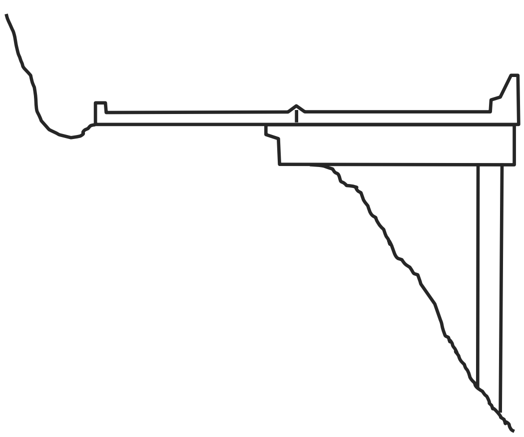


Figure 75. Cross-section view of a sidehill bridge.

Irregular Deck Area

Format	Frequency	Item ID
N (10,1)	I	B.G.15

Specification	Commentary
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.	Reporting the deck area calculated from plans may more accurately reflect the deck area for bridges with unusual geometry (e.g. 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.

Calculated Deck Area

Format	Frequency	Item ID
N (10,1)	C	B.G.16

Specification	Commentary
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.	

Example Bridge Geometry Data for Bridge Number 15558X

Figure 76. Elevation view of Bridge Number 15558X, looking east.

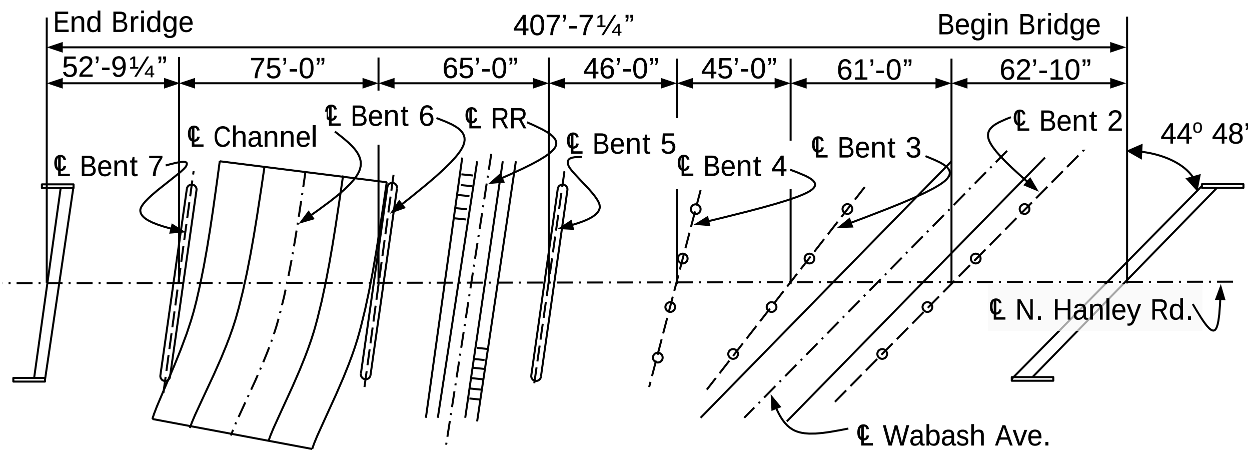


Figure 77. Plan view and dimensions for Bridge Number 15558X.

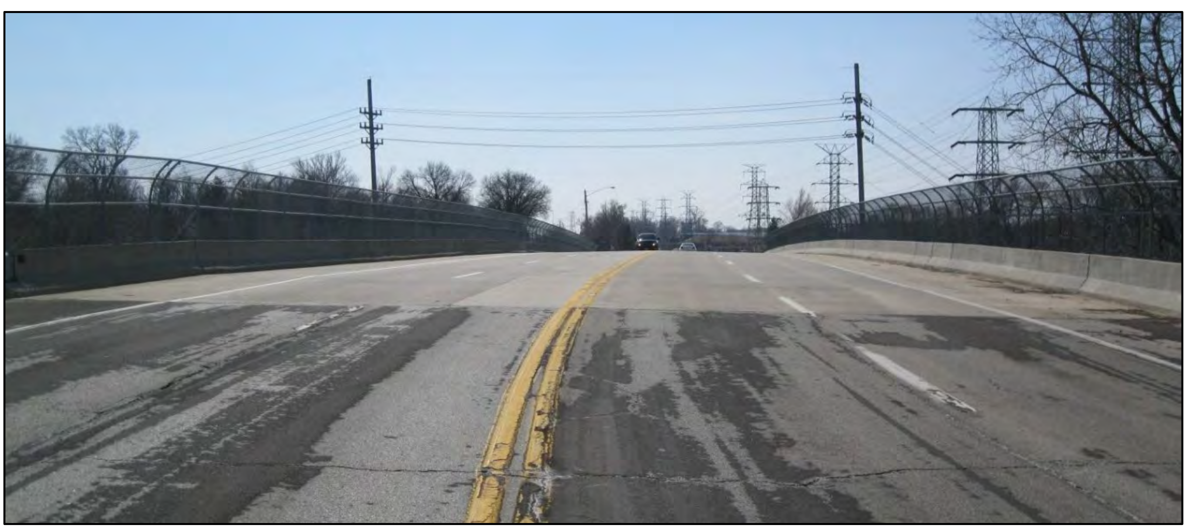


Figure 78. Approach view for Bridge Number 15558X, looking south.

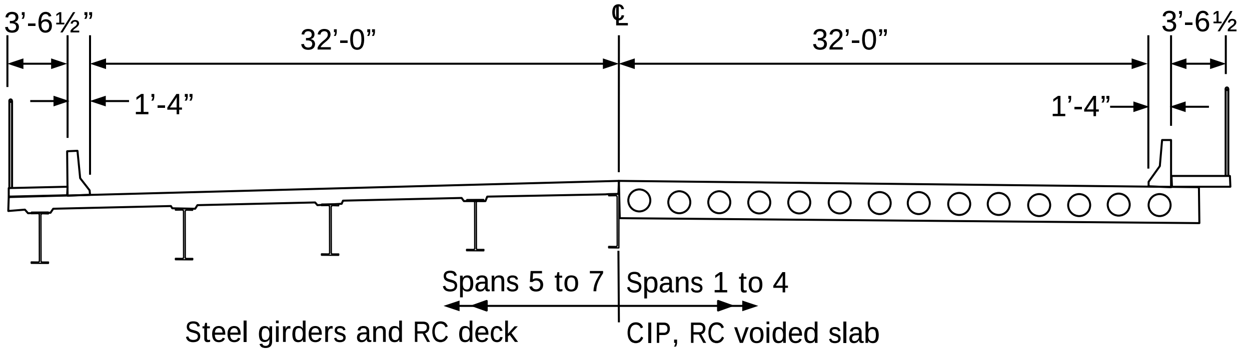


Figure 79. Typical cross-sections and dimensions for Bridge Number 15558X.

This bridge has an NBIS bridge length of 400'-7 1/4" measured along the centerline of North Hanley Road from front face-to-face of the abutments. The total bridge length is 407'-7 1/4" measured along the centerline of North Hanley Road from paving notch to paving notch (back face of abutments). The maximum span length is 75'-0" (span six) and the minimum span length is 45'-0" (span three). The bridge width out-to-out is 73'-9" and the bridge width curb-to-curb is 64'-0". There is a 3'-6 1/2" sidewalk on the left and right sides of the bridge. The approach roadway width is 66'-8". The substructure units have varying skews with abutment one (south end) having a maximum skew of 44 degrees 48 minutes. The maximum bridge height is 37'-6" at the centerline of the paved channel measured from the top of deck to the water surface. The calculated deck area is 30,080.9 ft^2 as determined by the FHWA by multiplying the value in Item B.G.02 *(Total Bridge Length)* by the value in Item B.G.05 *(Bridge Width Out-to-Out)*.

The bridge does not have medians, does not have curved or chorded girders, is not a sidehill bridge, and does not have an irregular deck area.

Table 8. Bridge Geometry data items in the Primary Data Set for Bridge Number 15558X.

Item ID	**Data Item**	**Value**
B.G.01	*NBIS Bridge Length*	400.6
B.G.02	*Total Bridge Length*	407.6
B.G.03	*Maximum Span Length*	75.0
B.G.04	*Minimum Span Length*	45.0
B.G.05	*Bridge Width Out-to-Out*	73.8
B.G.06	*Bridge Width Curb-to-Curb*	64.0
B.G.07	*Left Curb or Sidewalk Width*	3.5
B.G.08	*Right Curb or Sidewalk Width*	3.5
B.G.09	*Approach Roadway Width*	66.7
B.G.10	*Bridge Median*	0
B.G.11	*Skew*	45
B.G.12	*Curved Bridge*	N
B.G.13	*Maximum Bridge Height*	38
B.G.14	*Sidehill Bridge*	N
B.G.15	*Irregular Deck Area*	
B.G.16	*Calculated Deck Area* (Determined by FHWA*)	30080.9*

SECTION 4: FEATURES

This section has data items that have been grouped by the following five subsections: Feature Identification, Routes, Highways, Railroads, and Navigable Waterways. The data items in these subsections identify and describe the features that are above, below, and carried on bridges.

The data items in the Feature Identification subsection identify and locate features that are above, below, and carried on the bridge. These items are considered part of the Features Data Set and have a many-to-one relationship with a bridge.

The data items in the Routes and Highways subsections are reported when the feature type reported in Item B.F.01 *(Feature Type)* is a highway (e.g. code H01, H02, etc.).

The data items in the Routes subsection identify the routes that are carried on each highway feature reported in Item B.F.01 *(Feature Type)*. These items are considered part of the Routes Data Set and have a many-to-one relationship with a highway feature.

The data items in the Highways subsection provide information about the highways that are carried on, and that pass above or below the bridge. These items are considered part of the Features Data Set and have a many-to-one relationship with a bridge.

The data items in the Railroads subsection are reported when the feature type reported in Item B.F.01 *(Feature Type)* is a railroad (e.g. code R01, R02, etc.). The items in this subsection provide information about railroads that are carried on or pass below the bridge. These data items are considered part of the Features Data Set and have a many-to-one relationship with a bridge.

The data items in the Navigable Waterways subsection are reported when the feature type reported in Item B.F.01 *(Feature Type)* is a waterway (e.g. code W01, W02, etc.). The items in this subsection provide information on navigable waterways that pass below the bridge. These data items are considered part of the Features Data Set and have a many-to-one relationship with a bridge.

The data for items in this section typically remain static once a bridge has been inventoried. The following data items are included in this section.

SUBSECTION 4.1: FEATURE IDENTIFICATION

Item ID	Data Item
B.F.01	Feature Type
B.F.02	Feature Location
B.F.03	Feature Name

SUBSECTION 4.2: ROUTES

Item ID	Data Item
B.RT.01	Route Designation
B.RT.02	Route Number
B.RT.03	Route Direction
B.RT.04	Route Type
B.RT.05	Service Type

SUBSECTION 4.3: HIGHWAYS

Item ID	Data Item
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

SUBSECTION 4.4: RAILROADS

Item ID	Data Item
B.RR.01	Railroad Service Type
B.RR.02	Railroad Minimum Vertical Clearance
B.RR.03	Railroad Minimum Horizontal Offset

SUBSECTION 4.5: NAVIGABLE WATERWAYS

Item ID	Data Item
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

SUBSECTION 4.1: FEATURE IDENTIFICATION

The items in this subsection identify and locate features that are above, below, and carried on the bridge. These items are reported for each feature.

These data items are considered part of the Features Data Set and have a many-to-one relationship with a bridge. Therefore, each feature has a unique Feature data set, and there are typically multiple Feature data sets associated with a bridge.

The data for the items in this subsection typically remain static once a bridge has been inventoried. The following data items are included in this subsection.

Item ID	**Data Item**
B.F.01	Feature Type
B.F.02	Feature Location
B.F.03	Feature Name

Feature Type

Format	Frequency	Item ID
AN (3)	I	B.F.01

Specification	Commentary
Report the feature that is above, below, or carried on the bridge using one of the following codes. Code – Description H## – Highway R## – Railroad P## – Pathway W## – Waterway F## – Relief for waterway B## – Urban feature D## – Dry terrain or side slope X## – Other Replace the ## characters in the above codes with sequential numbers, with leading zeros, assigned to each feature type. For a double deck bridge that is inventoried with one unique bridge number, report a feature for each deck level. Report a railroad feature for each separate railroad service type, as identified in Item B.RR.01 *(Railroad Service Type)*, that is carried on or passes below the bridge. When a track carries multiple railroad service types, report only one feature. When multiple tracks carry the same railroad service type(s), report only one feature. Report one highway feature for a highway that is designated with two or more route numbers. Report multiple highway features when the highway is divided at the bridge.	All bridges have at least one feature carried on the bridge and one feature below the bridge. Some bridges have several features that are above, below, or carried on the bridge. Each feature type is numbered sequentially, starting with one (H01, R01, etc.). Highway features should be numbered beginning with the features carried on the bridge, followed by those below and above (H01, H02, H03, etc.). This item does not include ancillary structures and utilities. Reporting more than one Urban feature or Other feature is optional. For multi-level interchanges, report highway features directly above and below the bridge. The presence of a flush or mountable median on the bridge does not in itself indicate that the highway is divided. Use code R for each railroad service type listed in Item B.RR.01 *(Railroad Service Type)*. Use code P for separated pathways dedicated for pedestrian, bicycle, equestrian, or other non-highway modes of human transportation not covered in other codes. Use code W for each unique waterway. Do not use for roadside ditches or pipes that typically only carry roadway runoff from rain events. Use code F for bridges where one or more spans provide waterway openings for flow only during flood stages to provide additional hydraulic capacity, such as relief channels.

Commentary Continued – Feature Type
Use code B for urban features such as buildings, parking lots, etc. Use code D for features such as a natural depression or sidehill slope when there is no discernable waterway channel and none of the other feature codes apply. Use code X when no other code applies for features that exist below the bridge. For border bridges, the Neighboring State reports this item for all highway features carried on or passing above the bridge, as part of their abbreviated bridge record. For more information, see the Border Bridges section of this document.

Examples – Feature Type
A bridge carries I-66 eastbound and I-66 westbound over County Route 601 and Passage Creek. I-66 eastbound and westbound are divided at the bridge by an opening between two superstructure units supported by abutments common to both superstructures. • Report H01 for I-66 eastbound. • Report H02 for I-66 westbound. • Report H03 for County Route 601. • Report W01 for Passage Creek. A bridge carries I-68 eastbound and State Route 17 northbound over County Route 603, the Appalachian Trail, and Postage Creek. I-68 eastbound and State Route 17 northbound share a common highway that is not divided at the bridge. Above the bridge is a ramp connecting I-68 westbound to County Route 603 southbound. • Report H01 for I-68/SR17. • Report H02 for County Route 603. • Report H03 for the ramp. • Report P01 for the Appalachian Trail. • Report W01 for Postage Creek. A bridge carries Brookside Glen Drive over Union Creek. The bridge carries sidewalks on the north and south sides. • Report H01 for Brookside Glen Drive. • Report P01 for the sidewalks. • Report W01 for Union Creek.

Feature Location

Format	Frequency	Item ID
AN (1)	I	B.F.02

Specification	Commentary
Report the location for the feature reported in Item B.F.01 *(Feature Type)* that is above, below, or carried on the bridge using one of the following codes. Code / Description C — Carried on bridge A — Above bridge B — Below bridge T — Top level L — Lower level	This item has a corresponding code for each feature reported for Item B.F.01 *(Feature Type)*. Use code T for the top level of a double deck bridge that is inventoried using one unique bridge number. Use code L for the lower level of a double deck bridge that is inventoried using one unique bridge number. For border bridges, the Neighboring State reports this item for all highway features carried on or passing above the bridge, as part of their abbreviated bridge record. For more information, see the Border Bridges section of this document.

Examples

A bridge carries I-66 eastbound and I-66 westbound over County Route 601 and Passage Creek. I-66 eastbound and westbound are divided at the bridge by an opening between two superstructure units supported by abutments common to both superstructures.

- Report C for I-66 eastbound.
- Report C For I-66 westbound.
- Report B for County Route 601.
- Report B for Passage Creek.

A bridge carries I-68 eastbound and State Route 17 northbound over County Route 603, the Appalachian Trail, and Postage Creek. I-68 eastbound and State Route 17 northbound share a common highway that is not divided at the bridge. Above the bridge is a ramp connecting I-68 westbound to County Route 603 southbound.

- Report C for I-68/SR17.
- Report B for County Route 603.
- Report A for the ramp.
- Report B for the Appalachian Trail.
- Report B for Postage Creek.

A bridge carries Brookside Glen Drive over Union Creek. The bridge carries sidewalks on the north and south sides.

- Report C for Brookside Glen Drive.
- Report C for the sidewalks.
- Report B for Union Creek.

Feature Name

Format	Frequency	Item ID
AN (300)	I	B.F.03

Specification	Commentary
Report the commonly known name(s) for the feature reported in Item B.F.01 *(Feature Type)*. If the feature has no commonly known name, provide a general description. For more than one name, report all names with the most common name first. When applicable, report the route number first followed by other names. Report multiple names separated by pipe (|) delimiters.	This item has correlating data for each feature reported for Item B.F.01 *(Feature Type)*. The owner may include directional or other descriptive information in this field. Official names and local names may be included. For border bridges, the Neighboring State reports this item for all highway features carried on or passing above the bridge, as part of their abbreviated bridge record. For more information, see the Border Bridges section of this document.

Examples

I-90, commonly named Massachusetts Turnpike. Report I-90|Massachusetts Turnpike.

I-64, with no commonly known name. Report I-64.

US 50 & US 301 carried on one highway commonly named John Hanson Highway. Report US 50|US 301|John Hanson Highway.

I-95S carried on the lower deck of the George Washington Bridge. Report I95S|George Washington Bridge - Lower Deck.

I-495 northbound. Report I-495 NB.

A bridge carries I-68 eastbound (commonly named Harry Byrd Expressway), and State Route 17 northbound (commonly named Paris Pike) over County Route 603 (commonly named Blue Ridge Mountain Road), the Appalachian Trail, and Postage Creek. I-68 eastbound and State Route 17 northbound share a common highway that is not divided at the bridge. Above the bridge is a ramp connecting I-68 westbound to County Route 603 southbound.

- Report I-68|Harry Byrd Expressway|SR17|Paris Pike for I-68/SR17.
- Report County Route 603|Blue Ridge Mountain Road for County Route 603.
- Report I-68 WB to County Route 603 SB for the ramp.
- Report Appalachian Trail for the pathway.
- Report Postage Creek for the waterway.

A bridge carries Brookside Glen Drive over Union Creek. The bridge carries sidewalks on the north and south sides.

- Report Brookside Glen Drive for the highway.
- Report Sidewalks for the pathways.
- Report Union Creek for the waterway.

Example Feature Identification Data for Bridge Number 15558X

The example below shows the many-to-one relationship of the Feature Identification data, where there are typically multiple features associated with a bridge.

The bridge carries North Hanley Road (Value 1) over Wabash Avenue (Value 2), Burlington Northern/Santa Fe (BNSF) Railroad (Value 3), and Berkeley Branch Coldwater Creek (Value 4). There is a sidewalk on the east and west sides of the bridge (Value 5) and no sidewalk below the bridge.

Table 9. Feature Identification data items in the Features Data Set for Bridge Number 15558X.

Item ID	Data Item	Value (1)	Value (2)	Value (3)	Value (4)	Value (5)
B.F.01	*Feature Type*	H01	H02	R01	W01	P01
B.F.02	*Feature Location*	C	B	B	B	C
B.F.03	*Feature Name*	North Hanley Road	Wabash Avenue	BNSF RR	Berkeley Branch Coldwater Creek	Sidewalk east and west sides

SUBSECTION 4.2: ROUTES

The data items in this subsection identify the routes that are carried on each highway feature reported in Item B.F.01 *(Feature Type).* These data items are considered part of the Routes Data Set and have a many-to-one relationship with a highway feature. Therefore, each route reported in Item B.RT.01 *(Route Designation)* has a unique route data set, and there may be multiple route data sets associated with a highway feature.

For each highway feature that is carried on the bridge, report all route items.

For each highway feature that passes below the bridge and is not carried by another bridge, report all route items.

Do not report route items for highway features that pass above or below the bridge and are carried by another bridge. When needed, FHWA obtains the data for these highway feature(s) using the data reported for the crossing bridge, per Item B.H.18 *(Crossing Bridge Number)*.

The data for the items in this subsection typically remain static once a bridge has been inventoried. The following data items are included in this subsection.

Item ID	**Data Item**
B.RT.01	Route Designation
B.RT.02	Route Number
B.RT.03	Route Direction
B.RT.04	Route Type
B.RT.05	Service Type

Route Designation

Format	Frequency	Item ID
AN (3)	I	B.RT.01

Specification	Commentary
Report the assigned route designation for the highway reported in Item B.F.01 *(Feature Type)* using the following code. Code Description R## Unique Route Designation Replace the ## characters in the above code with sequential numbers, with leading zeros, assigned to each unique route designation carried on the highway feature (e.g., R01, R02, etc.). 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.	This item captures how routes that share the reported highway feature are designated. Each highway feature has at least 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. 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. For more information, see the Border Bridges section of this document.

Examples

I-35 southbound. Report R01.

Local road with no known route number. Report R01.

I-66 and State Route 17 northbound share one highway that is not divided at the bridge.

- Report R01 for I-66.
- Report R02 for State Route 17.

A ramp bridge departs from I-66 westbound and enters I-81 southbound.

- Report R01 for I-66.
- Report R02 for I-81.

One highway feature is signed for both State Highway 43 and Harlem Avenue.

- Report R01 for State Highway 43.
- Do not report a route record for Harlem Avenue.

Route Number

Format	Frequency	Item ID
AN (15)	I	B.RT.02

Specification	Commentary
Report the route number for the route reported in Item B.RT.01 *(Route Designation)*. Include letters that are used as part of the route numbers. Report 0 for routes without route numbers.	For divided highways, do not report the route direction. Identify that information in Item B.RT.03 *(Route Direction).* For border bridges, the Neighboring State reports this item for all highway features carried on the bridge, as part of their abbreviated bridge record. For more information, see the Border Bridges section of this document.

Examples

I-35 southbound. Report 35.

I-35W southbound. Report 35W.

State Highway 9A is not divided at the bridge. Report 9A.

Local road with no known route number. Report 0.

I-66 and State Route 17 northbound share one highway that is not divided at the bridge.

- Report 66 for the route designated as I-66.
- Report 17 for the route designated as State Route 17.

A ramp bridge departs from I-66 westbound and enters I-81 southbound.

- Report 66 for the route designated as I-66.
- Report 81 for the route designated as I-81.

Route Direction		
Format AN (2)	Frequency I	Item ID B.RT.03

Specification	Commentary
Report the designated route direction for the route reported in Item B.RT.01 *(Route Designation)* using one of the following codes. Code / Description NB Northbound EB Eastbound SB Southbound WB Westbound NS Northbound and Southbound EW Eastbound and Westbound	Use code NS when the route is not divided at the bridge, and carries traffic in both north and south directions. Use code EW when the route is not divided at the bridge, and carries traffic in both east and west directions. Use the designated route direction for the departure or entrance route when a bridge only carries a ramp; i.e. Item B.RT.05 *(Service Type)* is 7. Use the most applicable code when a route does not have a designated route direction. For border bridges, the Neighboring State reports this item for all highway features carried on the bridge, as part of their abbreviated bridge record. For more information, see the Border Bridges section of this document.

Examples

I-35 southbound. Report SB.

I-35W southbound. Report SB.

State Highway 9W is not divided at the bridge and carries traffic in north and south directions. Report NS.

A ramp bridge departs from I-66 westbound and enters I-81 southbound.

- Report WB for the route designated as I-66.
- Report SB for the route designated as I-81.

Bridge carries I-81 northbound and I-64 eastbound.

- Report NB for the route designated as I-81.
- Report EB for the route designated as I-64.

Route Type

Format	Frequency	Item ID
AN (1)	I	B.RT.04

Specification	Commentary
Report the route type for the route reported in Item B.RT.01 *(Route Designation)* using one of the following codes. Code / Description 1 Interstate route 2 U.S. route 3 State route 4 County route 5 City street 6 Federal lands road 7 State lands road X Other	Use code 4 for parish routes or other county route equivalents. Use code 5 for city or other municipal streets. Use code 6 when a public highway passes through Federal lands such as national parks, national forests, or DOD facilities and does not meet the description of codes 1 through 5. Use code 7 when a public highway passes through State lands such as State parks or State forests and does not meet the description of codes 1 through 5. Use code X when a public highway is not designated as one of the defined route type codes. For border bridges, the Neighboring State reports this item for all highway features carried on the bridge, as part of their abbreviated bridge record. For more information, see the Border Bridges section of this document.

Examples

Highway feature is signed for both I-35 and US-77.

- Report 1 for the route designated as I-35.
- Report 2 for the route designated as US-77.

Route is signed I-35 southbound. Report 1.

Route is signed State Highway 9W. Report 3.

A ramp bridge departs from VA-7 westbound and enters I-81 southbound.

- Report 3 for the route designated as VA-7.
- Report 1 for the route designated as I-81.

Service Type

Format	Frequency	Item ID
AN (1)	I	B.RT.05

Specification	Commentary
Report the designated service type for the route reported in Item B.RT.01 *(Route Designation)*, using one of the following codes. Code Description 1 Mainline 2 Alternate 3 Bypass 4 Spur 6 Business 7 Ramp, connector, etc. 8 Service or frontage road X Other	The service type designation is determined by the agency, and typically included as part of the signage for the route. Use code 7 for all types, arrangements, and sizes of turning roadways that connect two or more highways at an interchange. Use code 8 for frontage roads. These are typically parallel to the traveled way, may be provided on one or both sides of the mainline, and may or may not be continuous. A frontage road may include a U-turn lane. For Federal agency roads, report the most logical description of the service type compared to other routes within the facility. For border bridges, the Neighboring State reports this item for all highway features carried on the bridge, as part of their abbreviated bridge record. For more information, see the Border Bridges section of this document.

Examples

A ramp bridge connects I-66 westbound to I-81 southbound. Report 7.

I-35W southbound. Report 1.

Example Routes Data for Bridge Number 15558X

The bridge carries North Hanley Road over Wabash Ave., BNSF Railroad, and the Berkeley Branch of Coldwater Creek.

North Hanley Road (no route number) is a 4-lane, 2-way city street traveling north and south, which is not divided at the bridge. (Value 1)

Wabash Ave. (no route number) is a 2-lane, 2-way city street traveling east and west, which is not divided at the bridge, and is not carried on another bridge. (Value 2)

Items in the Routes subsection are only reported for highway features identified in Item B.F.01 *(Feature Type)* with code H. Therefore, the Routes subsection items are not reported for the railroad or the creek.

Table 10. Data items in the Routes Data Set for Bridge Number 15558X.

Item ID	Data Item	Value (1)	Value (2)
B.RT.01	*Route Designation*	R01	R02
B.RT.02	*Route Number*	0	0
B.RT.03	*Route Direction*	NS	EW
B.RT.04	*Route Type*	5	5
B.RT.05	*Service Type*	1	1

SUBSECTION 4.3: HIGHWAYS

The data items in this subsection provide information about the highways that are carried on, and that pass above or below the bridge. These data items are considered part of the Features Data Set and have a many-to-one relationship with a bridge. Therefore, each highway feature reported in Item B.F.01 *(Feature Type)* has a unique highway feature data set, and there are typically multiple highway feature data sets associated with a bridge.

For each highway feature that is carried on the bridge, report all applicable items.

For each highway feature that passes below the bridge and is not carried by another bridge, report all applicable items. Items B.H.12 *(Highway Maximum Usable Vertical Clearance)* and B.H.16 *(Highway Maximum Usable Surface Width)* apply to highway features below a bridge only when the highway feature carries an NHS route.

For each highway feature that passes above or below the bridge and is carried by another bridge, report only Item B.H.18 *(Crossing Bridge Number)*. When needed, FHWA obtains the data for these highway feature(s) using the data reported for the crossing bridge.

The data for the items in this subsection typically remain static once a bridge has been inventoried. The following data items are included in this subsection.

Functional Classification

Format	Frequency	Item ID
AN (1)	I	B.H.01

Specification	Commentary
Report the functional classification for the highway feature reported in Item B.F.01 *(Feature Type)* using one of the following codes. Code Description 1 Interstate 2 Principal Arterial – Other Freeways and Expressways 3 Principal Arterial – Other 4 Minor Arterial 5 Major Collector 6 Minor Collector 7 Local	Functional classifications result from the grouping of highways by the character of service they provide. Ensure that the functional classification designated in this item is consistent with the HPMS. When one highway feature carries multiple route types, report the code for the highest-class route following the hierarchy in the code descriptions; Interstate being the highest class. Use code 7 for State or Federal parkways and other park roads unless there is a through highway designated at a higher classification. FHWA Highway Functional Classification Concepts, Criteria, and Procedures website: *http://www.fhwa.dot.gov/planning/processes/statewide/related/highway_functional_classifications/*.

Urban Code

Format	Frequency	Item ID
AN (5)	I	B.H.02

Specification	Commentary
Report the urbanized area code consistent with the State's HPMS urban boundaries for the highway feature reported in Item B.F.01 *(Feature Type)* at the bridge.	Urban codes can be found at: https://www.census.gov/programs-surveys/geography/guidance/geo-areas/urban-rural.html. For bridges outside urbanized areas, use code 99999 for rural areas with population less than 5,000 and use code 99998 for small urban areas with population 5,000 to 49,999 in accordance with the HPMS Field Manual. FHWA approves adjusted urban boundaries submitted by State DOT planning offices. State's HPMS urban boundaries are based on the FHWA-approved adjusted urban boundaries. State maps of the unadjusted U.S. Census urban boundaries with highways (map layers: Labels, Transportation, and Urban Areas checked) can be found at: https://tigerweb.geo.census.gov.

Example

U.S. 13/113A over Saint Jones River. Report 24580.

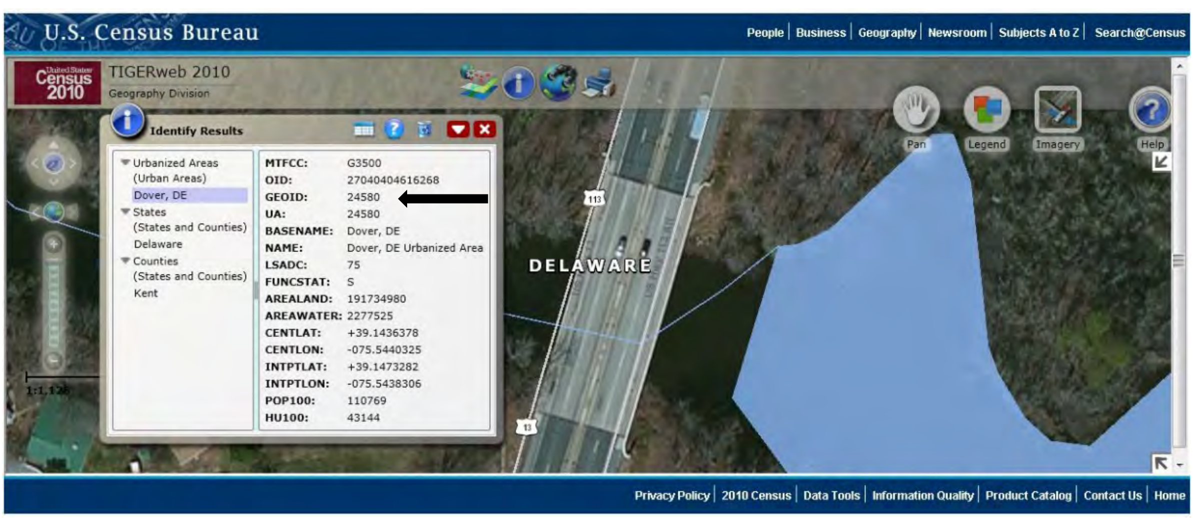


Figure 80. TIGERweb screen shot for the bridge in Delaware. (Source: US Census Bureau)

NHS Designation

Format	Frequency	Item ID
AN (1)	I	B.H.03

Specification	Commentary
Report the NHS designation for the highway feature reported in Item B.F.01 *(Feature Type)*, using one of the following codes. Code Description N Non-NHS Y NHS	The National Highway System (NHS) includes the Interstate Highway System as well as other roads important to the nation's economy, defense, and mobility. The NHS was developed by the U.S. Department of Transportation (DOT) in cooperation with the states, local officials, and metropolitan planning organizations (MPOs). The NHS includes the following subsystems of highways: Interstate, other principal arterials, STRAHNET, major STRAHNET connectors, and intermodal connectors. NHS routes and connectors are identified in the HPMS. State maps of the NHS can be found at: *http://www.fhwa.dot.gov/planning/national_highway_system/nhs_maps/.* For border bridges, the Neighboring State reports this item for all highway features carried on the bridge, as part of their abbreviated bridge record. For more information, see the Border Bridges section of this document.

National Highway Freight Network

Format	Frequency	Item ID
AN (1)	I	B.H.04

Specification	Commentary
Report the National Highway Freight Network (NHFN) designation for the highway feature reported in Item B.F.01 *(Feature Type)*, using one of the following codes. Code — Description 1 — Primary Highway Freight System 2 — Interstate portions not on the Primary Highway Freight System 3 — Critical Rural Freight Corridor 4 — Critical Urban Freight Corridor N — Not on the NHFN	This item is used to identify the National Highway Freight Network and to report to Congress on the conditions and performance of the network. This item is also used with other items to classify bridges according to serviceability, safety, and essentiality for public use and considers the potential impacts to emergency evacuation routes and to regional and national freight and passenger mobility if the serviceability of the bridge is restricted or diminished. More information can be found at: *http://www.ops.fhwa.dot.gov/freight/infrastructure/index.htm.*

STRAHNET Designation

Format	Frequency	Item ID
AN (1)	I	B.H.05

Specification	Commentary
Report the Strategic Highway Network (STRAHNET) designation for the highway feature reported in Item B.F.01 *(Feature Type)*, using one of the following codes. Code – Description 1 – STRAHNET route 2 – STRAHNET Connector route N – Not a STRAHNET route	The STRAHNET is a system of Interstate and primary highways and connectors that provide access to major US military installations and strategic ports, and provides continuity and emergency capabilities for defense purposes. The STRAHNET is determined by the Surface Deployment and Distribution Command (SDDC) in coordination with FHWA. STRAHNET routes and STRAHNET Connector routes can be found on NHS State maps at: *http://www.fhwa.dot.gov/planning/national_highway_system/nhs_maps/.*

LRS Route ID

Format	Frequency	Item ID
AN (120)	I	B.H.06

Specification	Commentary
Report the LRS Route ID defined by the State that is reported to the HPMS for the highway feature reported in Item B.F.01 *(Feature Type)*. The LRS Route ID must match the HPMS data exactly. Report N if an LRS Route ID has not been assigned.	The LRS Route ID is not necessarily the same as the route number posted along the highway, but is a number used to uniquely identify a route within a county or a State for GIS analysis and mapping purposes. Refer to the FHWA HPMS Field Manual at *http://www.fhwa.dot.gov/policyinformation/hpms/fieldmanual/.* For border bridges, the Neighboring State reports this item for all highway features carried on the bridge, as part of their abbreviated bridge record. For more information, see the Border Bridges section of this document.

LRS Mile Point		
Format N (8,3)	Frequency I	Item ID B.H.07

Specification	Commentary
Report the LRS mile point for the highway feature reported in Item B.F.01 *(Feature Type)* to the nearest thousandth of a mile. The mile point must be consistent with the LRS route and mile point system for the HPMS. For highway features that carry an LRS route, report the mile point at the beginning of the bridge. When the LRS route passes below the bridge, report the mile point on the LRS route where the bridge is first encountered.	The LRS mile point is used to establish the location of the bridge along the LRS route. If the highway does not carry an LRS route, report the most appropriate mile point. Refer to the FHWA HPMS Field Manual at *http://www.fhwa.dot.gov/policyinformation/hpms/fieldmanual/*. For border bridges, the Neighboring State reports this item for all highway features carried on the bridge, as part of their abbreviated bridge record. For more information, see the Border Bridges section of this document.

Examples
LRS Mile Point from HPMS is 130.344. Report 130.344. LRS Mile Point from HPMS is 9.600. Report 9.600. The highway does not carry an LRS route. The beginning of the bridge is 0.2 miles past the 34.0 mile marker. Report 34.2.

Lanes On Highway

Format	Frequency	Item ID
N (2,0)	I	B.H.08

Specification	Commentary
Report the number of highway traffic lanes for the highway feature reported in Item B.F.01 *(Feature Type)*. Report 1 when a highway is signed or striped for one-lane, but carries two-way traffic. Report 1 for a highway feature carried on the bridge when Item B.G.06 *(Bridge Width Curb-to-Curb)* is less than 16 feet and the bridge is not striped for full width traffic lanes.	For highway features carried on the bridge, include all lanes that are striped or otherwise operated as full width highway traffic lanes and special use lanes (e.g., merge lanes, ramp lanes, and left-turn lanes) - and run the entire length of the bridge. For highway features below the bridge that are not carried on another bridge, include all lanes that are striped or otherwise operated as full width highway traffic lanes and special use lanes (e.g., merge lanes, ramp lanes, and left-turn lanes) that pass below the entire width of the bridge.

Commentary Continued

Do not include pedestrian sidewalks, bike paths, or railroad tracks as lanes, unless the railroad tracks are concurrent with the highway lanes.

For double deck bridges and parallel bridges, report the number of lanes consistent with the highway feature reported in Item B.F.01 *(Feature Type)*.

For sidehill bridges, report the total number of lanes for the highway feature regardless if carried on the bridge or terrain/earth material.

Examples

Highway feature carried on the bridge has one lane. Report 1.

Highway feature carries two-way traffic on unstriped lanes and has a curb-to-curb width of 18 ft. Report 2.

Double deck bridge inventoried as one unique bridge number. Highway feature on top level carries five lanes. Highway feature on lower level carries five lanes.

- Report 5 for the highway feature on the top level.
- Report 5 for the highway feature on the lower level.

Annual Average Daily Traffic

Format	Frequency	Item ID
N (8,0)	I	B.H.09

Specification	Commentary
Report the annual average daily traffic (AADT) from the most recent count for the highway feature reported in Item B.F.01 *(Feature Type)*. The AADT must be compatible with the other items reported for the highway feature. Report the design AADT for a newly inventoried highway feature when actual AADT information is not yet available. Report the last open AADT for a highway feature that is temporarily closed until repair or replacement can be completed.	The AADT should be updated at intervals in accordance with the standards for the HPMS and standards/policies within the State. All traffic, including trucks, is counted in the AADT. The number of trucks counted in the AADT is reported in Item B.H.10 *(Annual Average Daily Truck Traffic).* When HPMS or other planning data are not available, use a best estimate based on site familiarity or functional classification in accordance with State standards and policies.

Annual Average Daily Truck Traffic

Format	Frequency	Item ID
N (8,0)	I	B.H.10

Specification	Commentary
Report the Average Annual Daily Truck Traffic (AADTT) from the most recent count for the highway feature reported in Item B.F.01 *(Feature Type)*. The AADTT must be compatible with the other items reported for the highway feature. Report the design AADTT for a newly inventoried highway feature when actual AADTT information is not yet available. Report the last open AADTT for a highway feature that is temporarily closed until repair or replacement can be completed.	The AADTT should be updated at intervals in accordance with the standards for the HPMS and standards/policies within the State. When HPMS or other planning data are not available, use a best estimate based on site familiarity or functional classification in accordance with State standards and policies. Do not include vans, pickup trucks, and other light delivery trucks in the AADTT. The AADTT represents vehicle classes 4-13 as described in FHWA's Traffic Monitoring Guide at: *http://www.fhwa.dot.gov/policyinformation/tmguide/*.

Year of Annual Average Daily Traffic

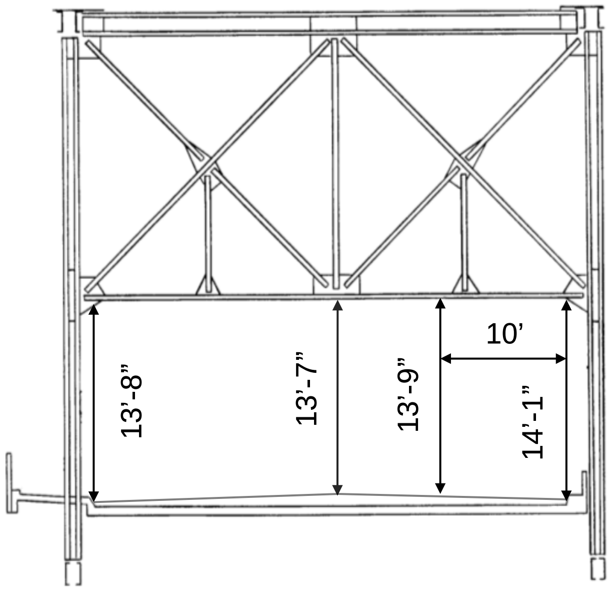
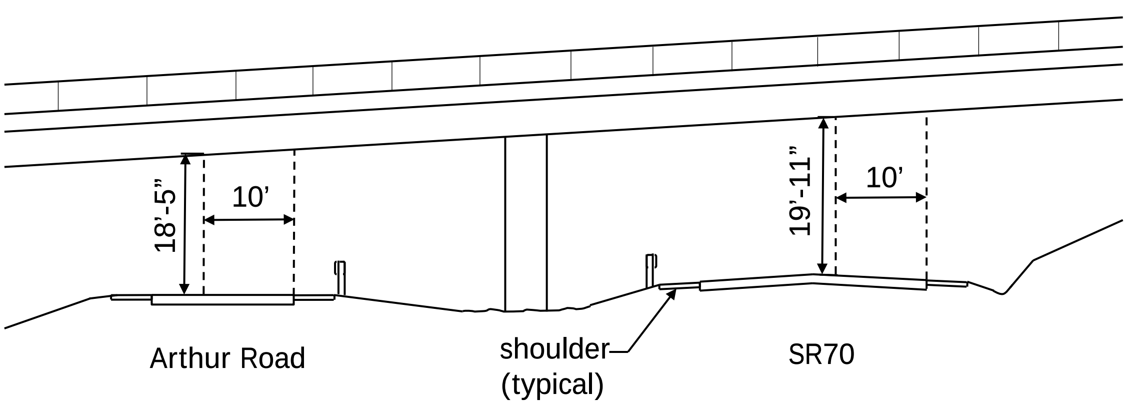
Format	Frequency	Item ID
N (4,0)	I	B.H.11

Specification	Commentary
Report the year associated with the data reported in Item B.H.09 *(Annual Average Daily Traffic)* for the highway feature reported in Item B.F.01 *(Feature Type)*.	The traffic data should be updated at intervals in accordance with the standards for the HPMS and standards/policies within the State.

Highway Maximum Usable Vertical Clearance

Format	Frequency	Item ID
N (3,1)	EI	B.H.12

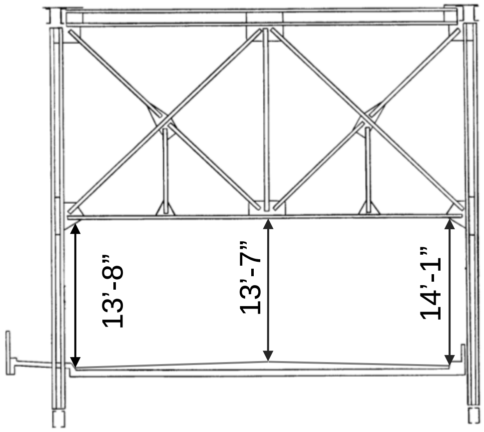
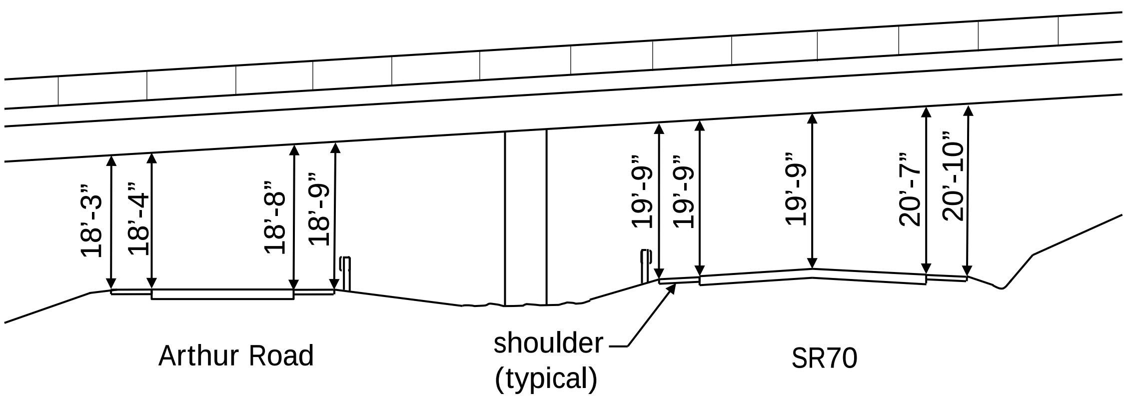
Specification	Commentary
Report the minimum vertical clearance for the highway feature reported in Item B.F.01 *(Feature Type),* measured over the 10-foot-wide envelope of the traveled part of the highway, that provides for the maximum usable clearance envelope, rounded down to the nearest tenth of a foot. Measure the vertical clearance plumb from the deck or highway surface to the lowest bridge member restriction, appurtenance (signs, utilities, etc.) attached to the bridge, or other structure. Report 99.9 when the clearance is 100 feet or greater or no restriction exists above the highway.	This item identifies the maximum height of a notional 10-foot wide vehicle that can pass on the highway feature(s) reported in Item B.F.01 *(Feature Type)*. This information is sometimes used for preliminary military routing. The data may not represent the absolute minimum clearance over the highway feature. Refer to Item B.H.13 *(Highway Minimum Vertical Clearance)* for the absolute minimum clearance. The traveled part of the highway feature does not include shoulders. These data may be different than the posted vertical clearance due to agency vertical clearance posting policies and procedures. These data are not sufficient for permit routing as the location of the 10-foot-wide envelope that provides for the maximum usable clearance is not reported. For a double decked bridge inventoried as one bridge, report this information for each highway feature on each level of the bridge. Update field measurements when alterations are made to the bridge or highway that affect the previously measured clearance. Reporting this item is optional for highway features below the bridge that do not carry NHS routes as identified in Item B.H.03 *(NHS Designation)*. Clearances greater than 30 feet may be estimated.

Example – Highway Maximum Usable Vertical Clearance
The bridge has a 13'-9" maximum usable vertical clearance. Report 13.7.  Figure 81. Cross-section view of through truss bridge showing vertical clearances.
The bridge carries a highway with no vertical clearance restrictions. Report 99.9. Arthur Road passes below the bridge and has an 18'-5" maximum usable vertical clearance. SR70 also passes below the bridge and has a 19'-11" maximum usable vertical clearance. • Report 18.4 for the Arthur Road highway feature. • Report 19.9 for the SR70 highway feature.  Figure 82. Elevation view with two separate highway features passing below the bridge.

Highway Minimum Vertical Clearance

Format	Frequency	Item ID
N (3,1)	EI	B.H.13

Specification	Commentary
Report the minimum vertical clearance measured over the highway feature reported in Item B.F.01 *(Feature Type)*, rounded down to the nearest tenth of a foot. Measure the vertical clearance plumb from the deck or highway surface (including paved or stabilized shoulders) to the lowest bridge member restriction, appurtenance (signs, utilities, etc.) attached to the bridge, or other structure. Report 99.9 when the clearance is 100 feet or greater or no restriction exists above the highway.	Several measurements may need to be made to determine the minimum vertical clearance. However, only the minimum measurement is reported. Shoulders must be contiguous with the traveled way and must be structurally adequate for all weather and traffic conditions consistent with the facility carried. Unstabilized grass or dirt, with no base course, flush with and beside the traffic lane is not to be considered a shoulder for this item. Refer to agency policy for when and where stabilized shoulders are used. When it is not readily known if stabilized construction details were used, the presence of rutting, heaving, water retention, or other distress may be used as indicators that the shoulder is not stabilized. These data may be different than the posted vertical clearance due to agency vertical clearance posting policies and procedures. Update field measurements when alterations are made to the bridge or highway that affect the previously measured clearance. Clearances greater than 30 feet may be estimated.

Examples – Highway Minimum Vertical Clearance
The bridge has a 13'-7" minimum vertical clearance. Report 13.5.  Figure 83. Cross-section view of a through truss bridge showing minimum vertical clearance.
The bridge carries a highway with no vertical clearance restrictions. Report 99.9. Two highway features below the bridge. Arthur Road passes below the bridge and has an 18'-3" minimum vertical clearance. SR70 also passes below the bridge and has a 19'-9" minimum vertical clearance. • Report 18.2 for the Arthur Road highway feature. • Report 19.7 for the SR70 highway feature.  Figure 84. Elevation view with two separate highway features passing below the bridge.

Highway Minimum Horizontal Clearance, Left

Format	Frequency	Item ID
N (3,1)	I	B.H.14

Specification	Commentary
Report the minimum horizontal clearance on the left, for the highway feature reported in Item B.F.01 *(Feature Type)*, rounded down to the nearest tenth of a foot. Measure from the left edge line of the highway (excluding shoulders, turn lanes, acceleration, or deceleration lanes) in the direction of travel to the nearest substructure unit, rigid barrier, oncoming traffic lane, or toe of slope that is steeper than 1 to 3 (vertical to horizontal). Report 99.9 when the clearance is 100 feet or greater. Report 0 when the highway is a two-way highway that is not divided at the bridge. Do not report this item for highway feature(s) carried on the bridge.	This item provides data for the highway feature(s) reported in Item B.F.01 *(Feature Type)* that pass below the bridge. Highways undivided at the bridge are reported as 0 due to the adjacent oncoming traffic lane which provides no horizontal clearance to the left. Reinforced concrete and masonry traffic safety features are considered rigid barriers; metal and timber railings are not considered rigid barriers. Clearances greater than 30 feet may be estimated.

Examples

Highway feature below the bridge carries 1-way traffic, looking in the direction of travel. Report 20.0.

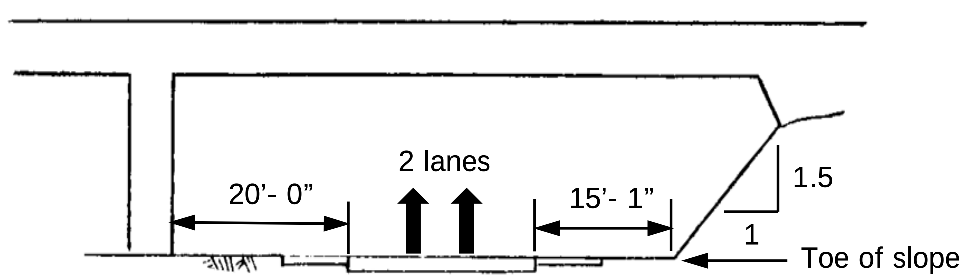
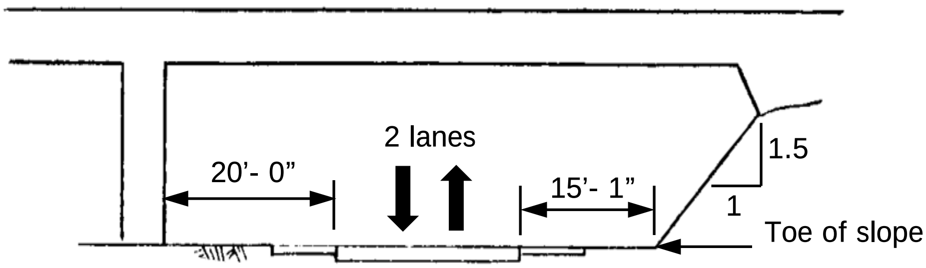
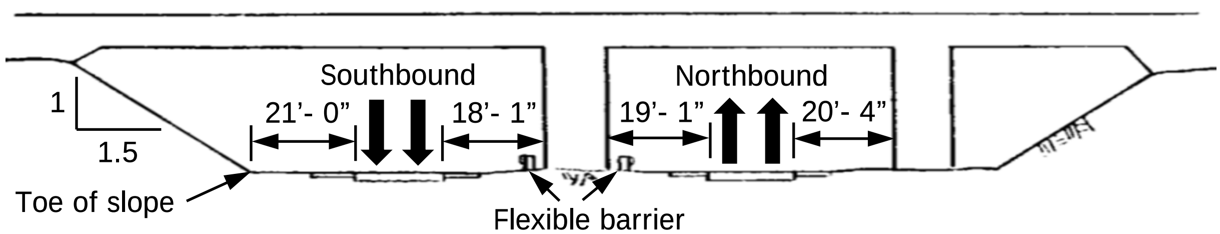
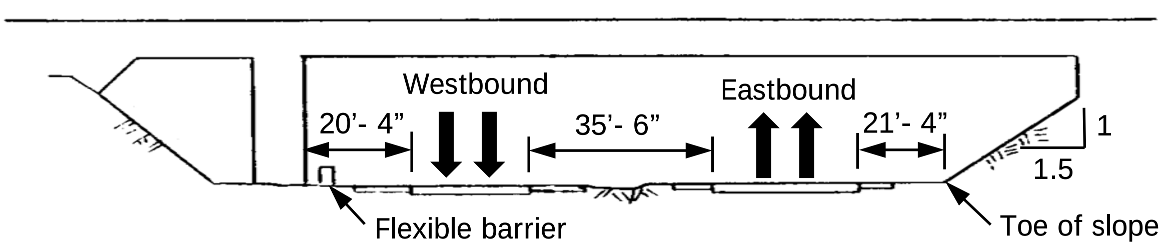
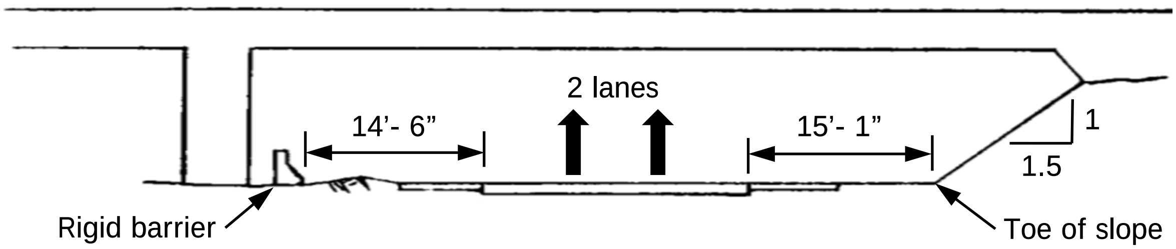
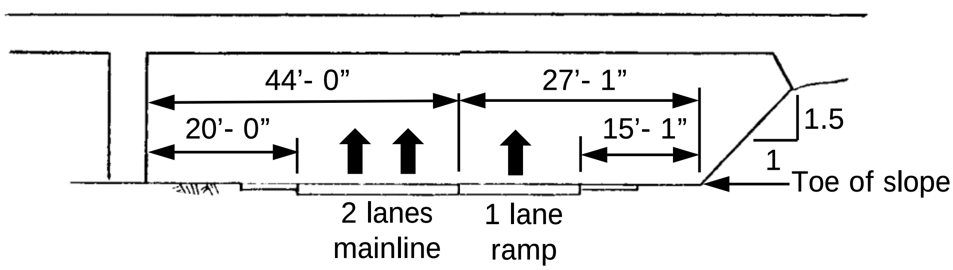


Figure 85. Bridge elevation view of horizontal clearances for a 2-lane highway with 1-way traffic below the bridge.

Examples Continued – Highway Minimum Horizontal Clearance, Left
Highway feature below the bridge carries two-way traffic. Report 0.  Figure 86. Bridge elevation view of horizontal clearances for a 2-lane highway with 2-way traffic below the bridge.
Two highway features below the bridge for a highway that is divided at the bridge. One highway feature carries 1-way traffic southbound and one carries 1-way traffic northbound. • Report 18.0 for the southbound highway feature. • Report 19.0 for the northbound highway feature.  Figure 87. Bridge elevation view of horizontal clearances for separate southbound and northbound highway features below the bridge, with flexible barriers.
Two highway features below the bridge for a highway that is divided at the bridge. One highway feature carries 1-way traffic eastbound and one carries 1-way traffic westbound. • Report 35.5 for the eastbound highway feature. • Report 35.5 for the westbound highway feature.  Figure 88. Bridge elevation view of horizontal clearances for separate westbound and eastbound highway features below the bridge, with flexible barrier.

Examples Continued – Highway Minimum Horizontal Clearance, Left
Highway feature below the bridge carries 1-way ramp traffic, looking in the direction of travel. Report 14.5.  Figure 89. Bridge elevation view of horizontal clearances for a 2-lane, 1-way highway feature below the bridge, with a rigid barrier.
Highway feature below the bridge carries 1-way mainline traffic and 1-way ramp traffic, looking in the direction of travel. Report 20.0.  Figure 90. Bridge elevation view of horizontal clearances for a highway feature below the bridge carrying mainline and ramp.

Highway Minimum Horizontal Clearance, Right

Format	Frequency	Item ID
N (3,1)	I	B.H.15

Specification	Commentary
Report the minimum horizontal clearance on the right, for the highway feature below the bridge reported in Item B.F.01 *(Feature Type)*, rounded down to the nearest tenth of a foot. Measure from the right edge line of the highway (excluding shoulders, turn lanes, acceleration, or deceleration lanes) in the direction of travel to the nearest substructure unit, rigid barrier, oncoming traffic lane or toe of slope that is steeper than 1 to 3 (vertical to horizontal). Report 99.9 when the clearances are 100 feet or greater. Do not report this item for highway feature(s) carried on the bridge.	This item provides data for the highway feature(s) reported in Item B.F.01 *(Feature Type)* that pass below the bridge. Reinforced concrete and masonry traffic safety features are considered rigid barriers; metal and timber railings are not considered rigid barriers. Clearances greater than 30 feet may be estimated.

Examples

Highway feature below the bridge carries 1-way traffic, looking in the direction of travel. Report 15.0.

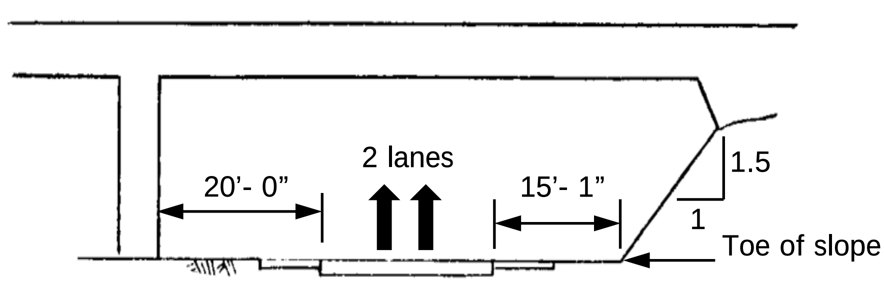


Figure 91. Bridge elevation view of horizontal clearances for a 2-lane highway feature with 1-way traffic below the bridge.

Examples Continued – Highway Minimum Horizontal Clearance, Right

Highway feature below the bridge carries two-way traffic. Report 15.0.

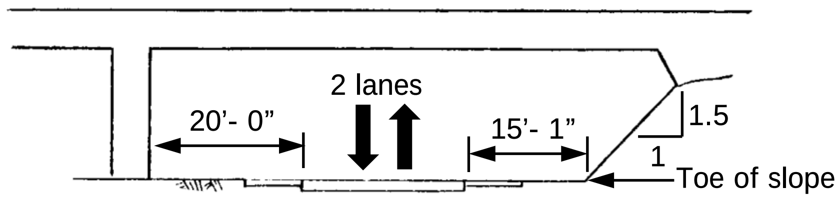


Figure 92. Bridge elevation view of horizontal clearances for a 2-lane highway feature with 2-way traffic below the bridge.

Two highway features below the bridge for a highway that is divided at the bridge. One highway feature carries 1-way traffic southbound and one carries 1-way traffic northbound.

- Report 21.0 for the southbound highway feature.
- Report 20.3 for the northbound highway feature.

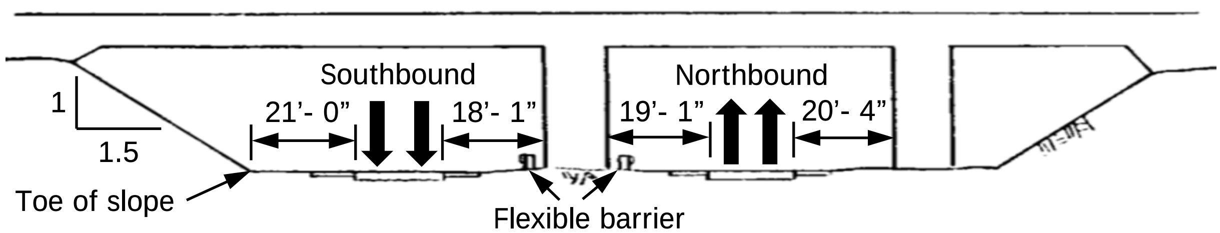


Figure 93. Bridge elevation view of horizontal clearances for separate southbound and northbound highway features below the bridge, with flexible barriers.

Two highway features below the bridge for a highway that is divided at the bridge. One highway feature carries 1-way traffic eastbound and one carries 1-way traffic westbound.

- Report 21.3 for the eastbound highway feature.
- Report 20.3 for the westbound highway feature.

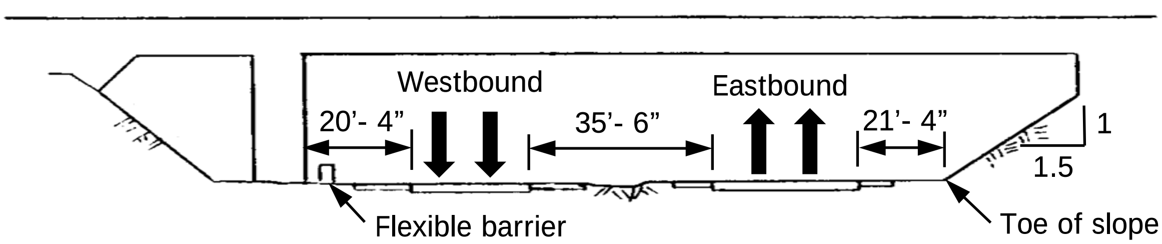


Figure 94. Bridge elevation view of horizontal clearances for separate westbound and eastbound highway features below the bridge, with a flexible barrier.

Examples Continued – Highway Minimum Horizontal Clearance, Right
Highway feature below the bridge carries 1-way ramp traffic, looking in the direction of travel. Report 15.0.

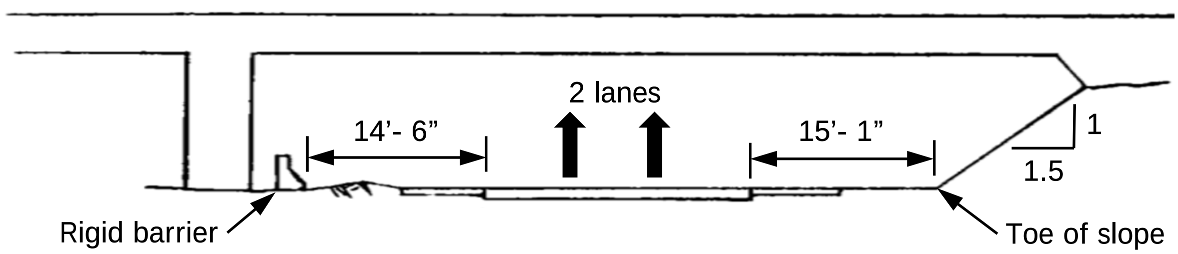


Figure 95. Bridge elevation view of horizontal clearances for a 2-lane, 1-way highway feature below the bridge, with a rigid barrier.

Highway feature below the bridge carries 2-way traffic. Report 14.5.

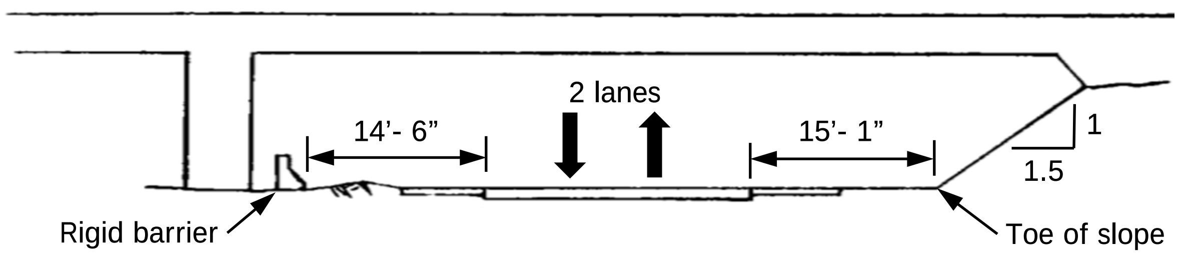


Figure 96. Bridge elevation view of a 2-lane, 2-way highway feature below the bridge, with a rigid barrier.

Highway feature below the bridge carries 1-way mainline traffic and 1-way ramp traffic, looking in the direction of travel. Report 15.0.

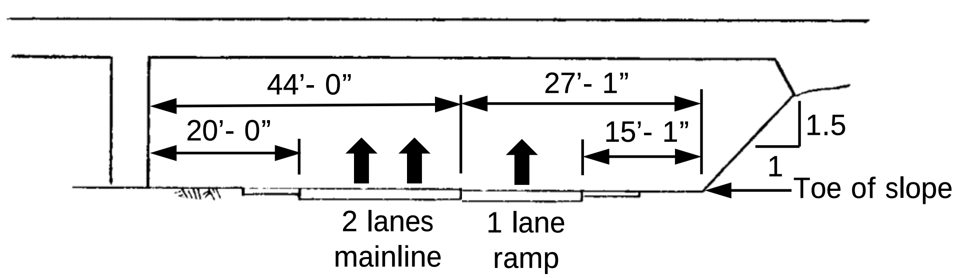


Figure 97. Bridge elevation view of horizontal clearances for highway feature carrying mainline and ramp traffic below the bridge.

Highway Maximum Usable Surface Width

Format	Frequency	Item ID
N (3,1)	I	B.H.16

Specification	Commentary
Report the maximum usable surface width for the highway feature reported in Item B.F.01 *(Feature Type)* that passes below or is carried on the bridge, rounded down to the nearest tenth of a foot. Measure the width perpendicular to the centerline of the highway (including paved or stabilized shoulders). Report 99.9 when the surface width is 100 feet or greater.	Shoulders are included when they are contiguous with the traveled way and structurally adequate for all weather and traffic conditions consistent with the facility carried. Unstabilized grass or dirt, with no base course, flush with and beside the traffic lane is not considered a shoulder for this item. Refer to agency policy for when and where stabilized shoulders are used. When it is not readily known if stabilized construction details were used, the presence of rutting, heaving, water retention, or other distress may be used as indicators that the shoulder is not stabilized.

Commentary Continued

Flush (striped) and mountable medians are not considered restrictions.

A curb greater than 6 inches high may be considered non-mountable for these specifications.

Use the least restrictive configuration when movable rigid barriers are used to accommodate reversible lanes for non-construction-related applications.

Reporting this item is optional for highway features below the bridge that do not carry NHS routes as identified in Item B.H.03 *(NHS Designation)*.

Examples

Two highway features below the bridge. One highway feature carries eastbound traffic and one carries westbound traffic.

- Report 34.6 for the eastbound highway feature.
- Report 42.4 for the westbound highway feature.

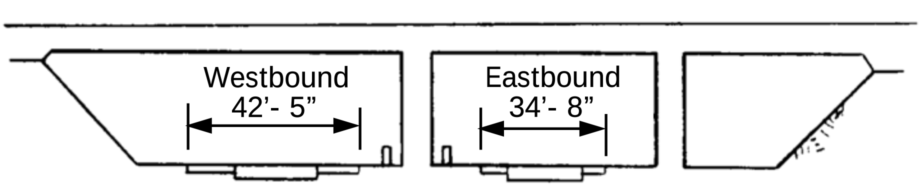


Figure 98. Bridge elevation view of two separate highway features below the bridge.

Examples Continued – Highway Maximum Usable Surface Width

One highway feature carried on the bridge. Highway feature carries 2-way traffic that is not divided at the bridge. Report measurement A.

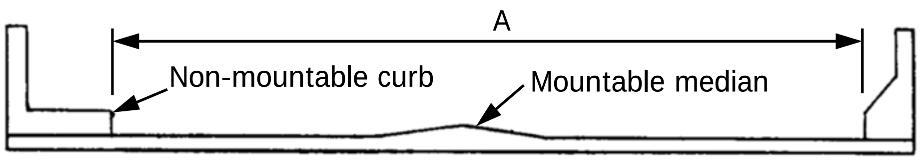


Figure 99. Cross-section view of a highway feature carried on the bridge with a mountable median.

Two highway features carried on the bridge. Highway 1 (H01) and Highway 2 (H02) are divided at the bridge by the non-mountable median.

- Report measurment A for H01.
- Report measurement B for H02.

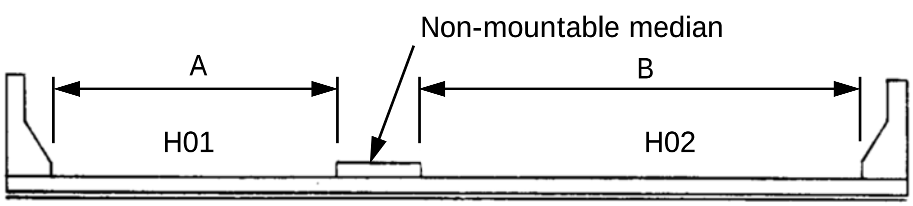


Figure 100. Cross-section view of two highway features carried on the bridge with a non-mountable median.

Two highway features carried on the pipe culvert under fill. Highway 1 (H01) and Highway 2 (H02) are divided at the bridge.

- Report measurement A for H01.
- Report measurement B for H02.

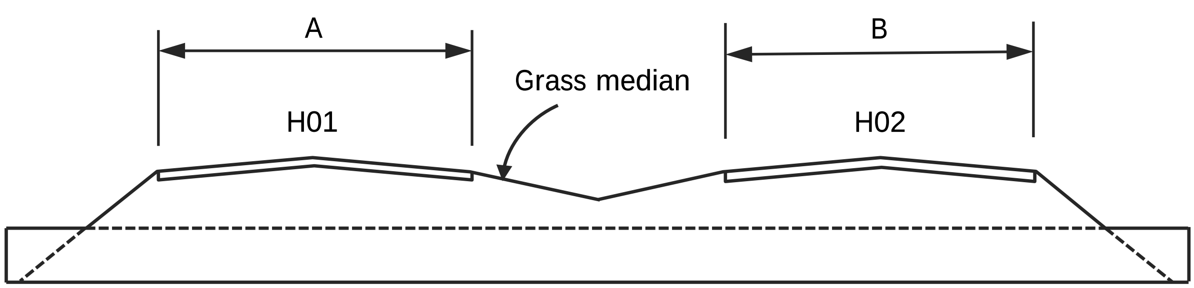


Figure 101. Cross-section view of two highway features carried on the pipe culvert under fill with a grass median.

Bypass Detour Length		
Format N (3,0)	Frequency I	Item ID B.H.17

Specification	Commentary
Report the length to the nearest mile of the total additional travel for a vehicle to bypass the bridge for the highway feature reported in Item B.F.01 *(Feature Type)*, that passes below or is carried on the bridge. Report 999 where a detour does not exist. Report 0 for available ground level bypass. Report 1 when the highway feature is carried by a bridge, is not at an interchange, and a parallel bridge can be used as a temporary bypass with a reasonable amount of crossover grading.	Determine bypass detour length by evaluating the potential to move traffic, including military vehicles and trucks, around bridges. • Avoid detour routes that have load, height, or capacity limitations unacceptable for the additional traffic detoured onto them. • Consider using the parallel bridge of dual bridges or temporary culverts if emergency detours can be constructed with a reasonable amount of grading within the existing right-of-way. • Consider using ramps and/or frontage roads in interchanges. • Review plans for strategic bridge detour routes.

Examples

Diamond interchange. Bridge can be bypassed. Report 0.

Cloverleaf. Bridge cannot be bypassed; 18-mile detour. Report 18.

Highway feature carried on the bridge with a 4-mile detour *(Figure 102)*. Report 4.

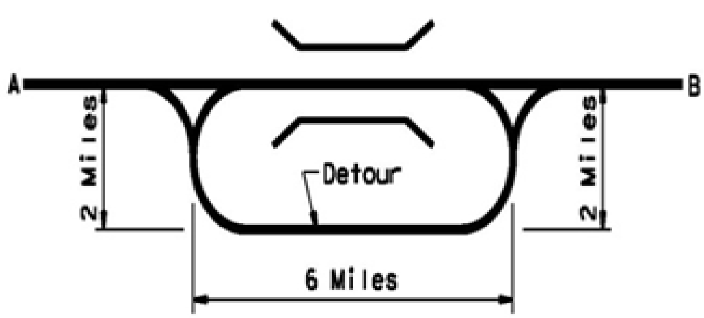


Figure 102. Detour map for a highway feature carried on the bridge.

Examples Continued – Bypass Detour Length
Highway feature passes below the bridge with a 0-mile detour *(Figure 103)*. Report 0.

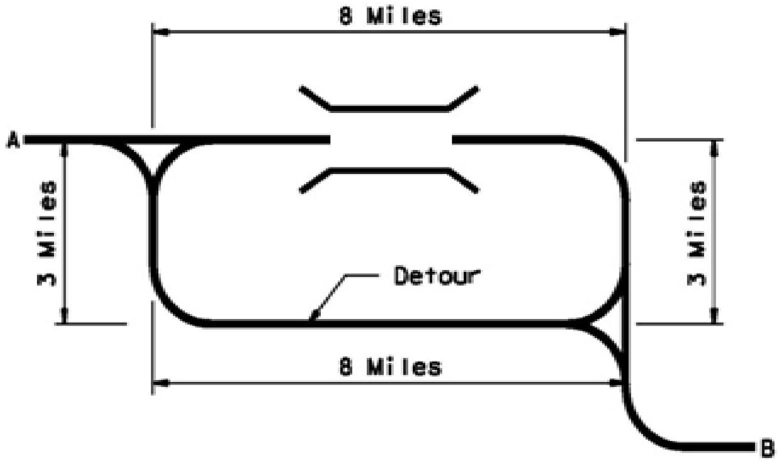


Figure 103. Detour map for a highway feature that passes below the bridge.

Crossing Bridge Number

Format	Frequency	Item ID
AN (15)	I	B.H.18

Specification	Commentary
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. 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.	The intent of this item is to capture the bridge number for bridges of a multi-level interchange, where bridges pass directly above or below other bridges. 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. For more information, see the Border Bridges section of this document.

Example

The inventoried bridge number 300000B-X636010 passes above bridge number 300000B-X638012 and passes below 300000B-X635010 and 30000B-X634010.

- Report 300000B-X638012 for the bridge below.
- Report 300000B-X635010 for the bridge above.
- Report 300000B-X634010 for the other bridge above.

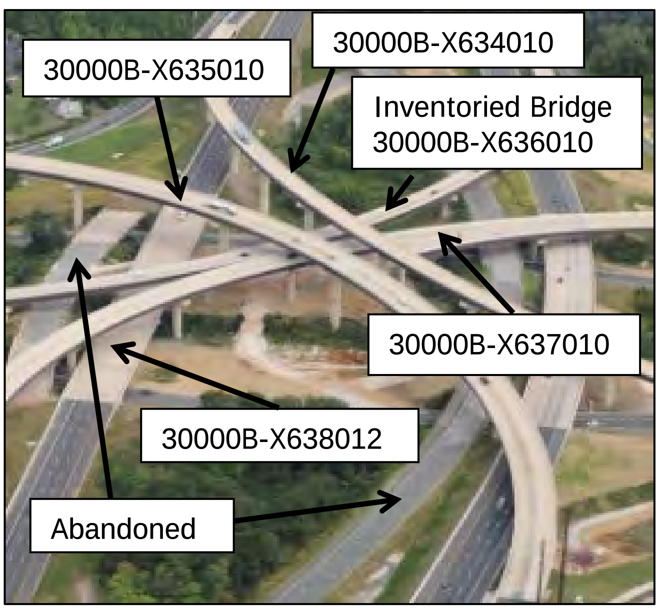


Figure 104. Multi-level interchange with bridges passing above and below other bridges. (Source: Maryland Transportation Authority)

Example Highway Data for Bridge Number 15558X

The bridge carries North Hanley Road over Wabash Ave., BNSF Railroad, and the Berkeley Branch of Coldwater Creek. The bridge is in the St. Louis Urban Area (code: 77770).

North Hanley Road (no route number) is a 4-lane, 2-way city street traveling north and south, which is not divided at the bridge. The functional class is other principle arterial. It is an NHS route. The 2014 Annual Average Daily Traffic is 8,376 with a truck percentage of 10% (838 by count). The bridge carries a highway with no vertical clearance restrictions. The maximum usable surface width of the highway carried on the bridge is 64’-0”. The bypass detour length is 1 mile. (Value 1)

Wabash Ave. (no route number) is a 2-lane, 2-way city street traveling east and west, which is not divided at the bridge, and is not carried on another bridge. It is not on the NHS. The Annual Average Daily Traffic is not available but estimated at 300 with a truck percentage of 15% (45 by count) due to the industrial nature of the area. Wabash Ave. passes below the bridge and has a 22’-5” maximum usable vertical clearance (reporting optional because this is not an NHS route), a 21’-9” minimum vertical clearance, a minimum horizontal clearance to the right of 7’-8”, and a maximum usable surface width of 22’-0” (reporting optional because this is not an NHS route). Wabash Ave. is a dead-end road. Therefore, there is no bypass detour. (Value 2)

Neither highway is on the National Freight Network nor the STRAHNET, and no LRS data has been assigned to either highway.

No highways are carried on bridges passing above or below the bridge.

Items in the Highways subsection are only reported for highway features identified in Item B.F.01 *(Feature Type)* with code H. Therefore, the Highways subsection items are not reported for the railroad or the creek.

Table 11. Highway feature data items in the Features Data Set for Bridge Number 15558X.

Item ID	**Data Item**	**Value (1)**	**Value (2)**
B.H.01	*Functional Classification*	3	7
B.H.02	*Urban Code*	77770	77770
B.H.03	*NHS Designation*	Y	N
B.H.04	*National Highway Freight Network*	N	N
B.H.05	*STRAHNET Designation*	N	N
B.H.06	*LRS Route ID*	N	N
B.H.07	*LRS Mile Point*		
B.H.08	*Lanes On Highway*	4	2
B.H.09	*Annual Average Daily Traffic*	8376	300
B.H.10	*Annual Average Daily Truck Traffic*	838	45
B.H.11	*Year of Annual Average Daily Traffic*	2014	2014
B.H.12	*Highway Maximum Usable Vertical Clearance*	99.9	22.4
B.H.13	*Highway Minimum Vertical Clearance*	99.9	21.7
B.H.14	*Highway Minimum Horizontal Clearance, Left*		0
B.H.15	*Highway Minimum Horizontal Clearance, Right*		7.6
B.H.16	*Highway Maximum Usable Surface Width*	64	22
B.H.17	*Bypass Detour Length*	1	999
B.H.18	*Crossing Bridge Number*		

SUBSECTION 4.4: RAILROADS

The data items in this subsection provide information about railroads that are carried on or pass below the bridge. These data items are considered part of the Features Data Set and have a many-to-one relationship with a bridge. Therefore, each railroad feature reported in Item B.F.01 *(Feature Type)* has a unique railroad feature data set, and there may be multiple railroad feature data sets associated with a bridge.

Item B.RR.01 *(Railroad Service Type)* is reported for all railroads, and the remaining items are reported only for railroads below the bridge, i.e. when Item B.F.02 *(Feature Location)* is B.

The dimensional values for the items in this subsection can be obtained from either plans or field measurement.

The data for the items in this subsection typically remain static once a bridge has been inventoried. The following data items are included in this subsection.

Item ID	**Data Item**
B.RR.01	Railroad Service Type
B.RR.02	Railroad Minimum Vertical Clearance
B.RR.03	Railroad Minimum Horizontal Offset

Railroad Service Type

Format	Frequency	Item ID
AN (2)	I	B.RR.01

Specification	Commentary
Report the designated railroad service type for the railroad feature reported in Item B.F.01 *(Feature Type)* using one of the following codes. Code / Description F Freight FE Freight - electrified P Passenger PE Passenger - electrified M Multiple services - not electrified ME Multiple services - electrified I Inactive	Electrified is intended for electricity-powered rail lines and third-rails, but not for battery or fuel cell powered lines. Use code M when multiple rail services (such as freight and passenger rail) use the same tracks and both services are not electrified. Use code ME when multiple rail services (such as freight and passenger rail) use the same tracks, and at least one is electrified.

Examples

The bridge carries two highway features separated by two electrified passenger rail tracks (i.e. one railroad feature). Two railroad tracks pass below the bridge that both carry freight (i.e. one railroad feature).

- Report PE for the railroad feature carried on the bridge.
- Report F for the railroad feature below the bridge.

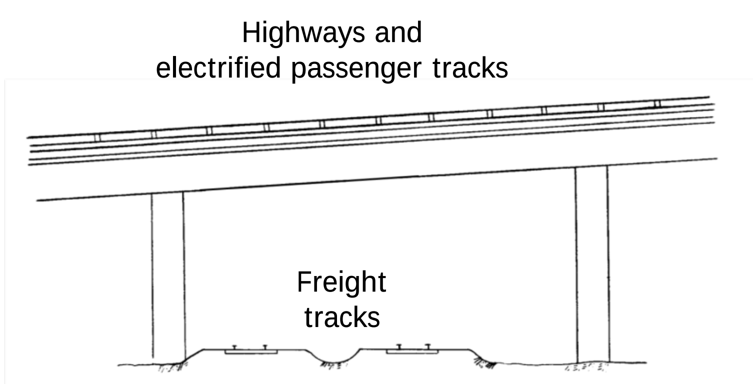
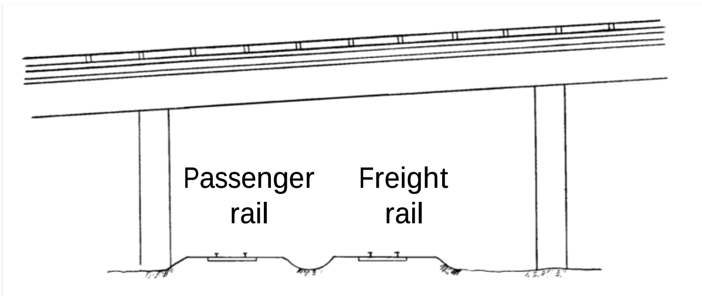
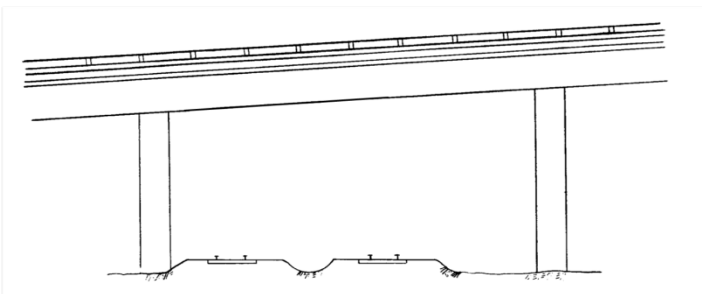
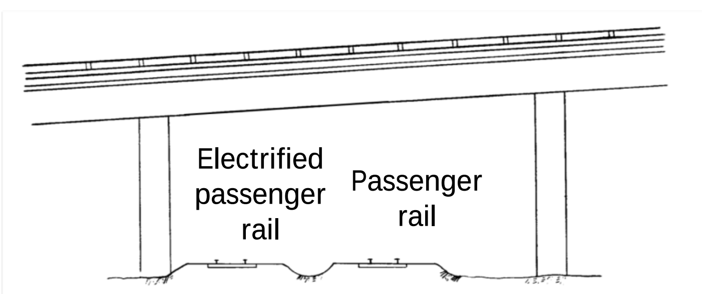


Figure 105. Bridge elevation view with two electrified passenger rail tracks carried on the bridge and two freight rail tracks below the bridge.

Examples Continued – Railroad Service Type
Two railroad tracks below the bridge. One carries passenger rail service and one carries freight (i.e. two railroad features). • Report P for the passenger rail feature. • Report F for the freight rail feature.  Figure 106. Bridge elevation view with one passenger rail and one freight rail track below the bridge.
Two railroad tracks below the bridge that both carry freight and passenger service (i.e. one railroad feature). Report M.  Figure 107. Bridge elevation view with two freight/passenger rail tracks below the bridge.
Two railroad tracks below the bridge. One carries electrified passenger service and one carries non-electrfied passenger service (i.e. two railroad features). • Report PE for the electrified passenger rail feature. • Report P for the non-electrified passenger rail feature.  Figure 108. Bridge elevation view with an electrified passenger rail track and a non-electrified passenger rail track below the bridge.

Railroad Minimum Vertical Clearance

Format	Frequency	Item ID
N (3,1)	EI	B.RR.02

Specification	Commentary
Report the minimum vertical clearance for the railroad feature reported in Item B.F.01 *(Feature Type)*, rounded down to the nearest tenth of a foot. Measure plumb from the top of rails to the lowest bridge restriction or appurtenance (signs, utilities, etc.) attached to the bridge. Appurtenances attached to the bridge that serve only a railroad purpose, such as catenary systems, are excluded from the measurement and do not reduce the vertical clearance measurement. Report 99.9 when the clearance is 100 feet or greater. Report this item only when Item B.F.02 *(Feature Location)* is B.	Several measurements may need to be made to determine the minimum vertical clearance for each railroad feature when one or more railroad tracks pass below the bridge. However, only the minimum measurement is reported. Update measurements when alterations are made to the bridge or railroad tracks that affect the previously measured clearance. Clearances greater than 30 feet may be estimated.

Examples

Two railroad tracks below the bridge that both carry freight and passenger service (i.e. one railroad feature). Report 31.2.

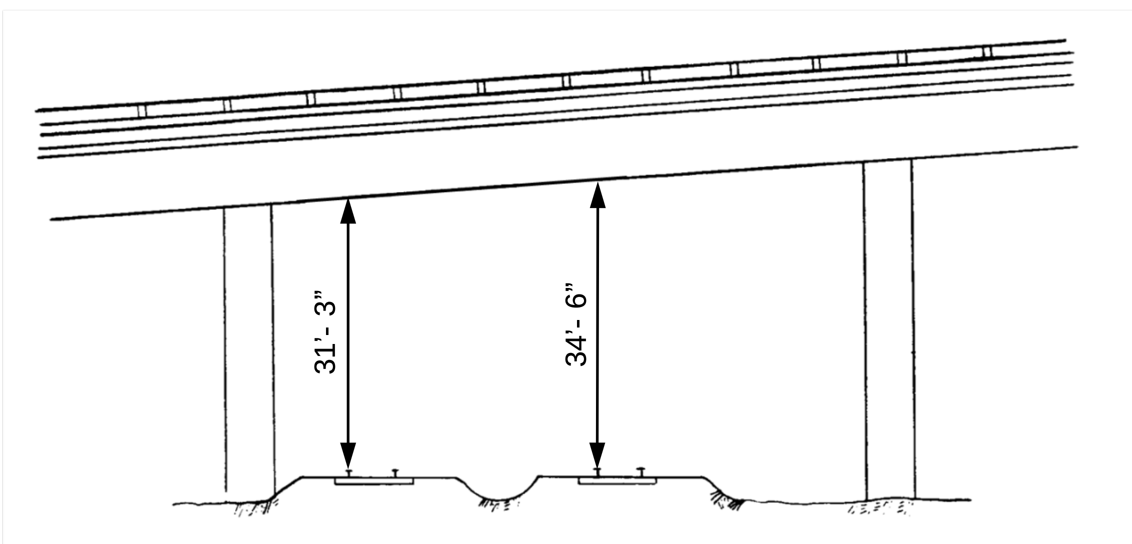
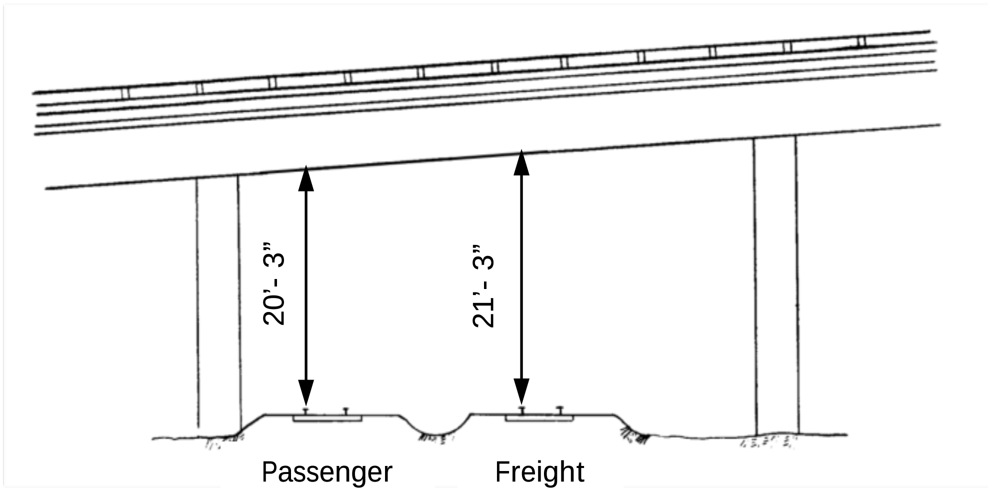


Figure 109. Bridge elevation view with two freight/passenger rail tracks below the bridge.

Examples Continued – Railroad Minimum Vertical Clearance
Two railroad tracks below the bridge. One carries passenger rail service, and one carries freight (i.e. two railroad features). • Report 20.2 for the passenger rail feature. • Report 21.2 for the freight rail feature.  Figure 110. Bridge elevation view with one passenger rail and one freight rail track below the bridge.

Railroad Minimum Horizontal Offset

Format	Frequency	Item ID
N (3,1)	I	B.RR.03

Specification	Commentary
Report the minimum horizontal offset for the railroad feature reported in Item B.F.01 *(Feature Type)*, rounded down to the nearest tenth of a foot. Measure perpendicular from the centerline of the tracks to the nearest substructure unit or toe of slope that is steeper than 1 to 3 (vertical to horizontal). For multiple tracks with the same railroad service type, report the minimum distance after measuring the offsets in both directions from all tracks. Report 99.9 when the minimum horizontal offset is 100 feet or greater. Report this item only when Item B.F.02 *(Feature Location)* is B.	The intent of this item is to collect the minimum distance from the centerline of the railroad track to a bridge related obstruction. Offsets greater than 30 feet may be estimated.

Examples

One railroad track below the bridge. Report 20.3.

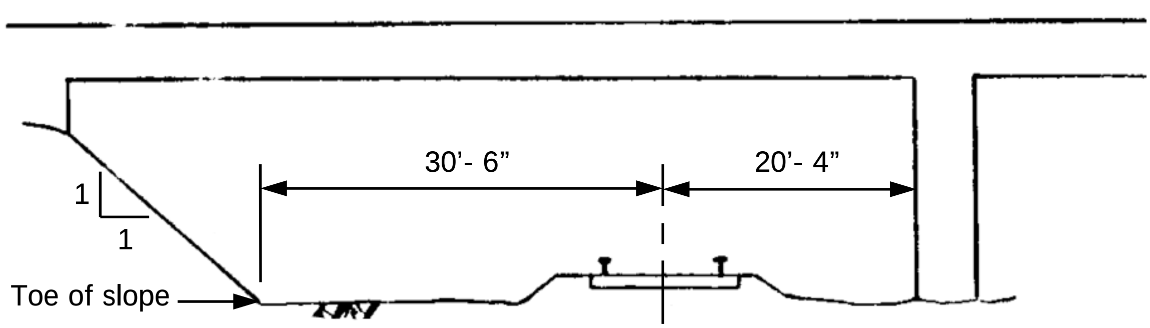


Figure 111. Bridge elevation view indicating horizontal offset for one railroad track below the bridge.

Examples Continued – Railroad Minimum Horizontal Offset
Two railroad tracks that both carry freight (i.e. one railroad feature). Report 18.5.

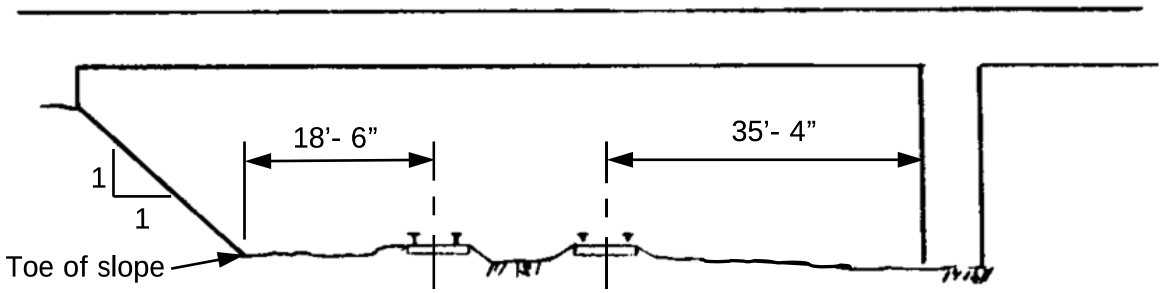


Figure 112. Bridge elevation view indicating horizontal offset for two railroad tracks below the bridge.

Example Railroad Data for Bridge Number 15558X

The bridge carries North Hanley Road over Wabash Avenue, BNSF Railroad (two tracks, both carrying freight rail service), and the Berkeley Branch of Coldwater Creek. The minimum vertical underclearance to the railroad tracks is 23’-0” and the minimum horizontal offset is 14’-0”.

Figure 113. Bridge elevation view of two railroad tracks below Bridge Number 15558X.

Figure 114. Freight train passing below Bridge Number 15558X

Table 12. Railroad data items in the Features Data Set for Bridge Number 15558X.

Item ID	Data Item	Value
B.RR.01	*Railroad Service Type*	F
B.RR.02	*Railroad Minimum Vertical Clearance*	23.0
B.RR.03	*Railroad Minimum Horizontal Offset*	14.0

SUBSECTION 4.5: NAVIGABLE WATERWAYS

The data items in this subsection provide information about the waterways that pass below the bridge. These data items are considered part of the Features Data Set and have a many-to-one relationship with a bridge. Therefore, each waterway feature reported in Item B.F.01 *(Feature Type)* has a unique waterway feature data set, and there may be multiple waterway feature data sets associated with a bridge.

Item B.N.01 *(Navigable Waterway)* is reported for all waterways, and the remaining items are reported only for navigable waterways, i.e. when Item B.N.01 *(Navigable Waterway)* is Y.

The dimensional values for the items in this subsection can be obtained from either plans or field measurement.

The data for the items in this subsection typically remain static once a bridge has been inventoried. The following data items are included in this subsection.

Item ID	Data Item
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

Navigable Waterway

Format	Frequency	Item ID
AN (1)	I	B.N.01

Specification	Commentary
Report whether the waterway feature reported in Item B.F.01 *(Feature Type)* is considered navigable waters of the United States using one of the following codes. Code / Description N — Not navigable waters Y — Navigable waters U — Navigable waters designation is undetermined	This item identifies bridges over navigable waters where the United States Coast Guard may exercise jurisdiction, as defined in 33 CFR, Part 2. This information helps identify bridges at risk from vessel collision and bridges where a Coast Guard permit may be required for modifications to the structure. Information helpful in coding this item may be found in design and construction documentation or prior correspondence with the Coast Guard. Navigable waterways are determined by the Commandant of the United States Coast Guard per Title 33 of the Code of Federal Regulations, Section 2.36.

Navigation Minimum Vertical Clearance

Format	Frequency	Item ID
N (4,1)	I	B.N.02

Specification	Commentary
Report the minimum vertical clearance over the waterway feature reported in Item B.F.01 *(Feature Type)*, rounded down to the nearest tenth of a foot. The reported clearance is from the highest datum plane referenced in the approved permit plans to the lowest superstructure restriction or other appurtenances attached to the bridge over the designated navigation channel. For all movable bridges, the vertical clearance reported for this item is for the bridge in the closed position (i.e., open to vehicular traffic). Report the most restrictive clearance when there are multiple designated navigation channels. Report this item only when Item B.N.01 *(Navigable Waterway)* is Y.	Reference datum, designated navigation channels, and vertical clearances can be found on permit plans approved by the United States Coast Guard. When permit plans are not available, values can be established from field measurements obtained for known navigation channels and the most restrictive clearance recorded. Reference field measurements to the following datum: Crossing Type — Datum Tidal waters — Mean High Water Non-tidal waters — Extreme High Water River — Q50 Surface Elevation

Examples

Permit plans for a bridge over tidal waters with the navigation channel designated by cross-hatched area. Permit plans set the datum at mean higher-high water (M.H.H.W.) instead of mean high water. Report 50.0.

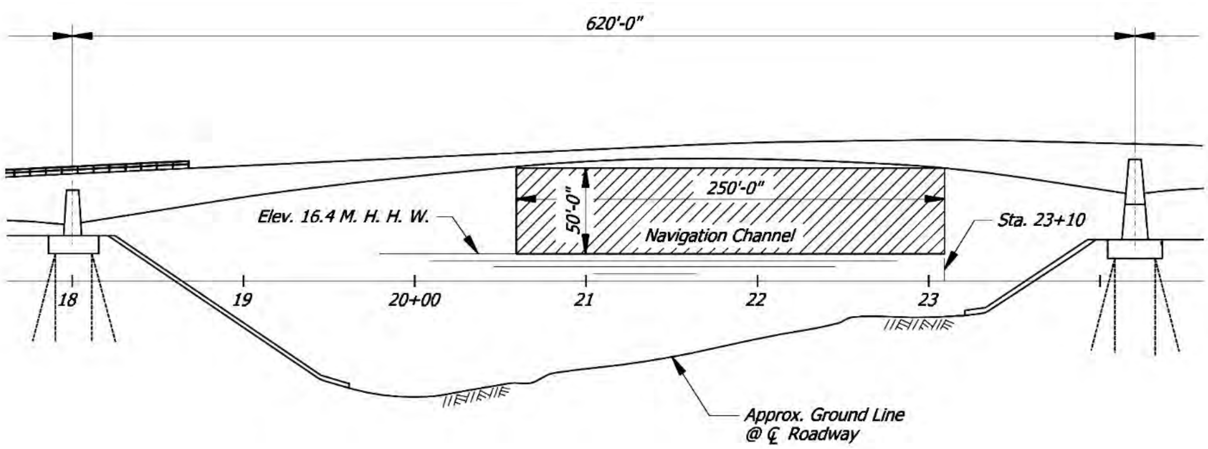


Figure 115. Bridge elevation view indicating navigation channel and vertical clearance. (Source: Alaska DOT)

Examples Continued - Navigation Minimum Vertical Clearance

Permit plans for a bridge over tidal waters with multiple designated navigation channels. Permit plans set the datum at mean higher-high water (M.H.H.W.) instead of mean high water. Report 23.1.

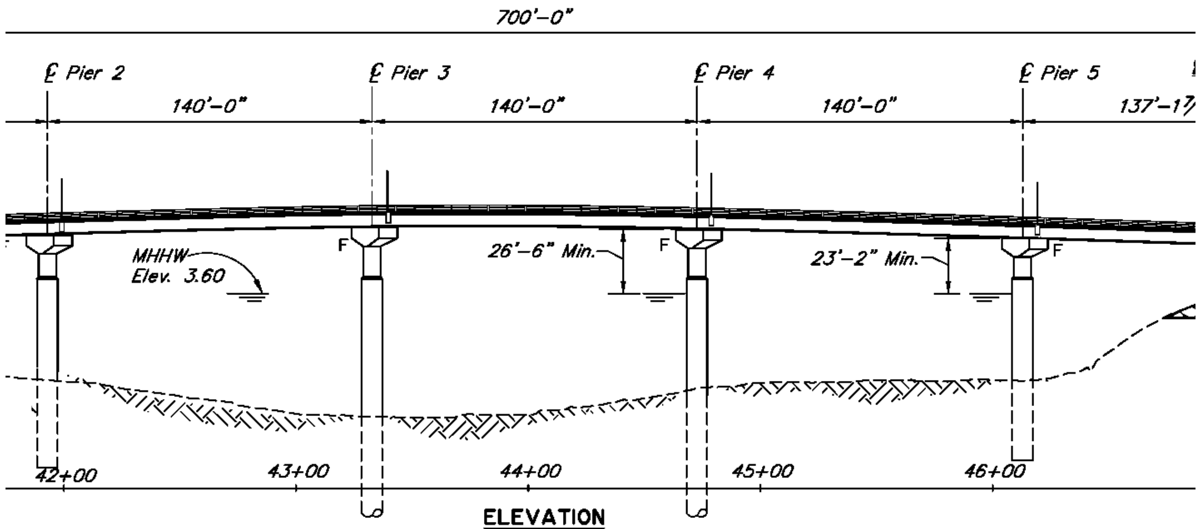


Figure 116. Bridge elevation view indicating multiple navigation channels and vertical clearances. (Source: Alaska DOT)

Vertical lift bridge. Information taken from "As-Built" plans as no permit plans are available. Mean High Water elevation is 3.2 ft. Minimum vertical underclearance is 12 ft – 3.2 ft = 8.8 ft. Report 8.8.

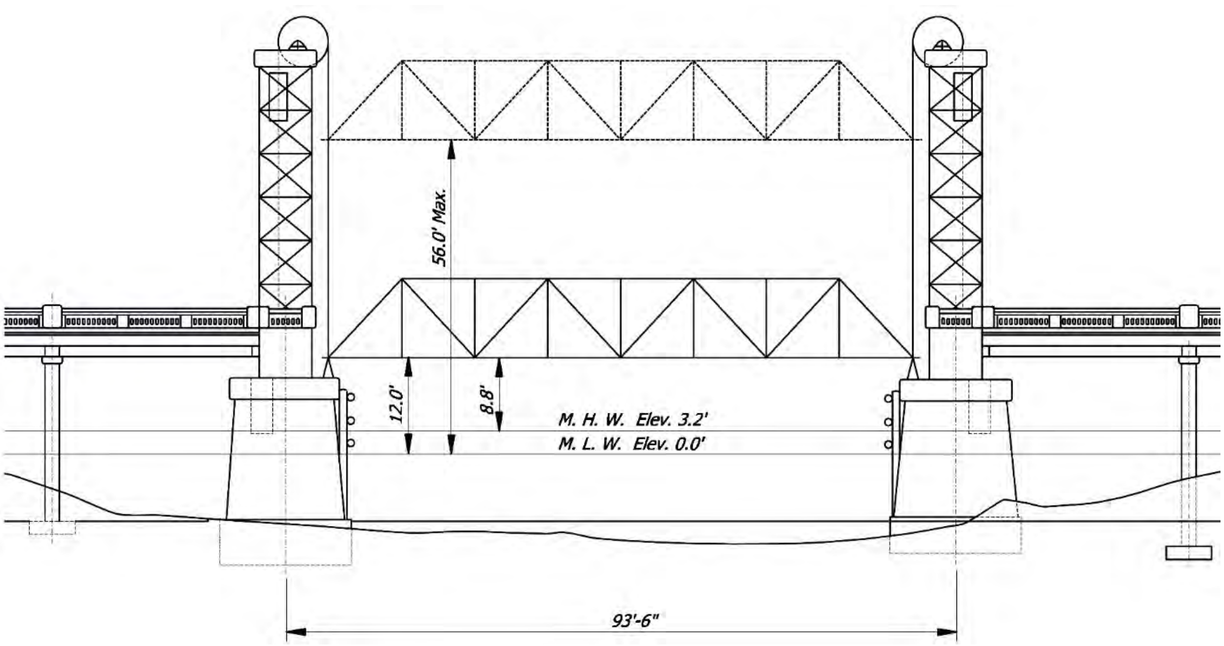


Figure 117. Bridge elevation view for a vertical lift bridge indicating vertical clearances. (Source: Florida DOT)

Movable Bridge Maximum Navigation Vertical Clearance

Format	Frequency	Item ID
N (4,1)	I	B.N.03

Specification	Commentary
Report the maximum vertical clearance over the waterway feature reported in Item B.F.01 *(Feature Type)*, rounded down to the nearest tenth of a foot. The reported clearance is from the highest datum plane referenced in the approved permit plans to the lowest superstructure restriction or other appurtenances attached to the bridge over the designated navigation channel, when the movable bridge is in the open position. Report 999.9 when the bridge provides unlimited vertical clearance over the navigation channel in the open position. Report this item only when Item B.N.01 *(Navigable Waterway)* is Y and Item B.SP.06 *(Span Type)* begins with M, indicating that the span type is movable.	The value reported for this item is particularly useful for vertical lift bridges and for bascule bridges where the leaf (or leaves) does not provide unlimited vertical clearance over the designated navigation channel in the open position. When permit plans are not available, values can be obtained from field measurements. Reference field measurements to the following datum: <u>Crossing Type</u> — <u>Datum</u> Tidal waters — Mean High Water Non-tidal waters — Extreme High Water River — Q50 Surface Elevation

Example

Vertical lift bridge. Information taken from "As-Built" plans as no permit plans are available. Mean High Water elevation is 3.2 ft. Maximum vertical underclearance is 56 ft – 3.2 ft = 52.8 ft. Report 52.8.

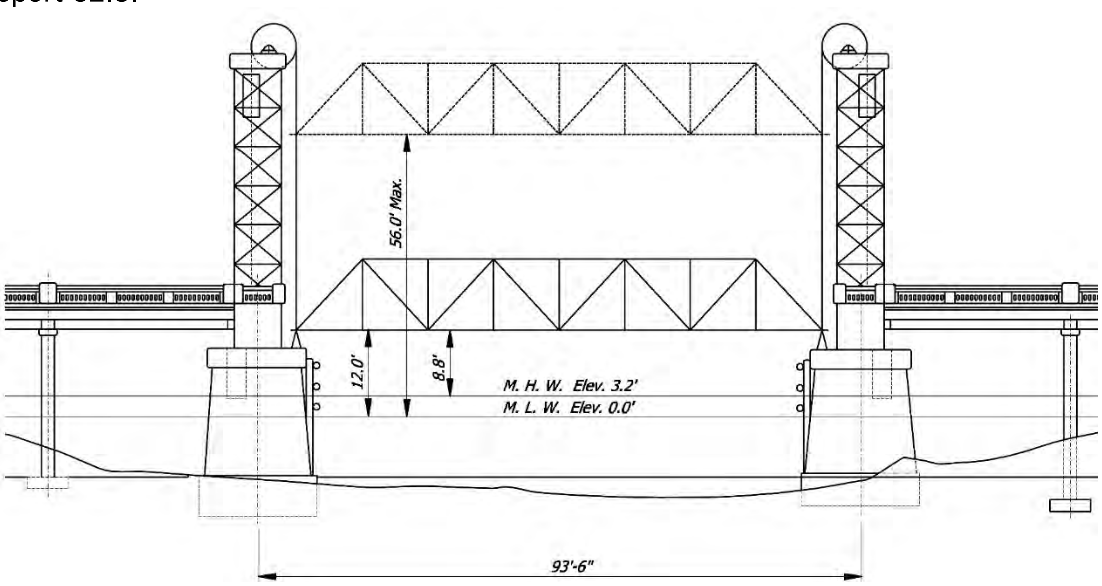


Figure 118. Bridge elevation view for a vertical lift bridge indicating vertical clearances. (Source: Florida DOT)

Navigation Channel Width

Format	Frequency	Item ID
N (5,1)	I	B.N.04

Specification	Commentary
Report the navigation channel width for the waterway feature reported in Item B.F.01 *(Feature Type)*, rounded down to the nearest tenth of a foot. The width is as shown on the approved permit plans, or field measured when the navigation channel changes or is unmarked. For field measurements, measure the horizontal distance perpendicular to the centerline of the navigation channel. For marked channels measure between the markers designating the limits of the channel at the bridge. For unmarked channels, measure the minimum clear distance between fenders or piers. If multiple channels exist, report the most restrictive. Report this item only when Item B.N.01 *(Navigable Waterway)* is Y.	The width provided here should be consistent with the navigation channel used in the navigation vertical clearance items. The designated navigation channel width may be less than the distance between substructure units.

Examples

Permit plans for a bridge over tidal waters with the navigation channel designated by cross-hatched area. Report 250.0.

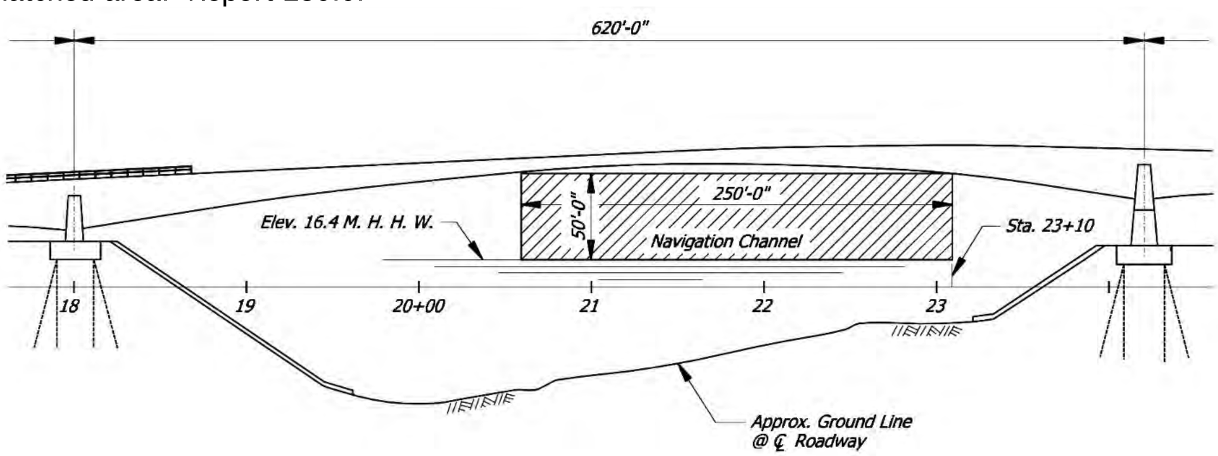
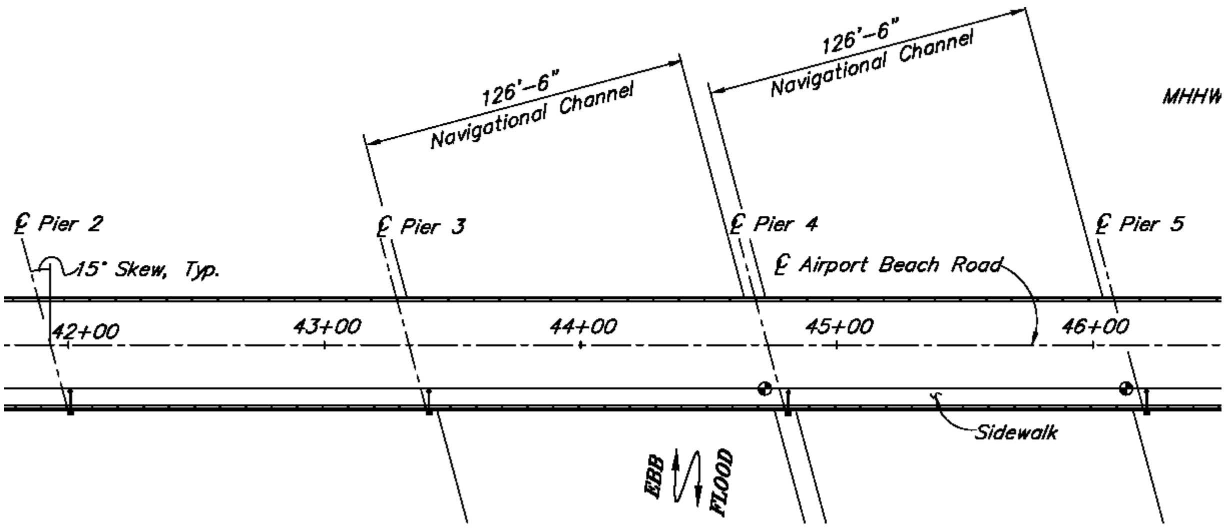


Figure 119. Bridge elevation view indicating navigation channel width dimensions. (Source: Alaska DOT)

Examples Continued - Navigation Channel Width
Bridge with multiple designated navigation channels bounded by piers. Report 126.5.  Figure 120. Bridge plan view indicating navigation channel width dimensions. (Source: Alaska DOT)

Navigation Channel Minimum Horizontal Clearance

Format	Frequency	Item ID
N (5,1)	I	B.N.05

Specification	Commentary
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. The 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. 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. 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. Report this item only when Item B.N.01 *(Navigable Waterway)* is Y.	The intent of this item is to collect the most restrictive distance from the edge of the navigational channel to a bridge substructure to assess risk for vessel collision. The clearance provided here should be consistent with the navigation channel used in Item B.N.04 *(Navigation Channel Width)*.

Examples

Permit plans for a bridge over tidal waters with the navigation channel designated by cross-hatched area. No substructure units within the waterway. Report 9999.9.

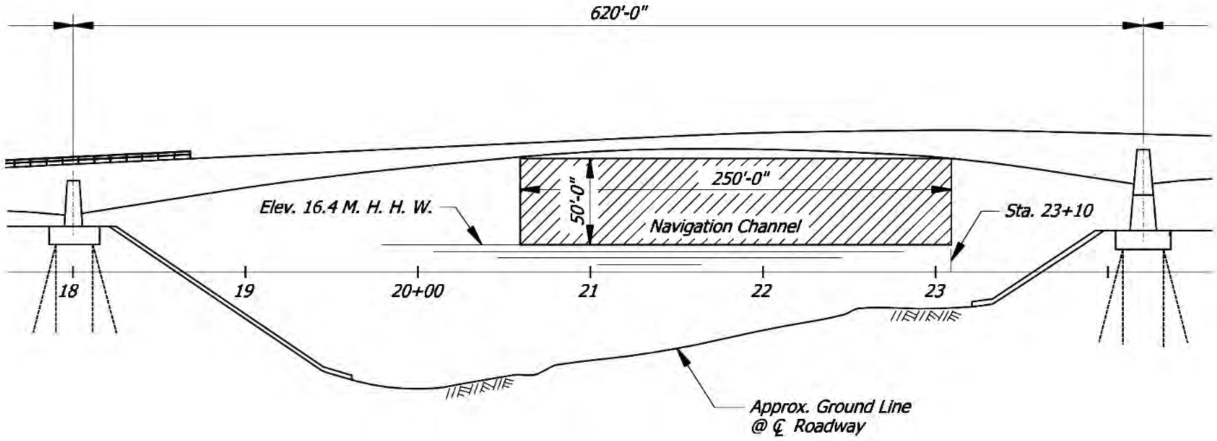


Figure 121. Bridge elevation view with no substructure units in the waterway. (Source: Alaska DOT)

Bridge with multiple designated navigation channels bounded by piers. Report 0.

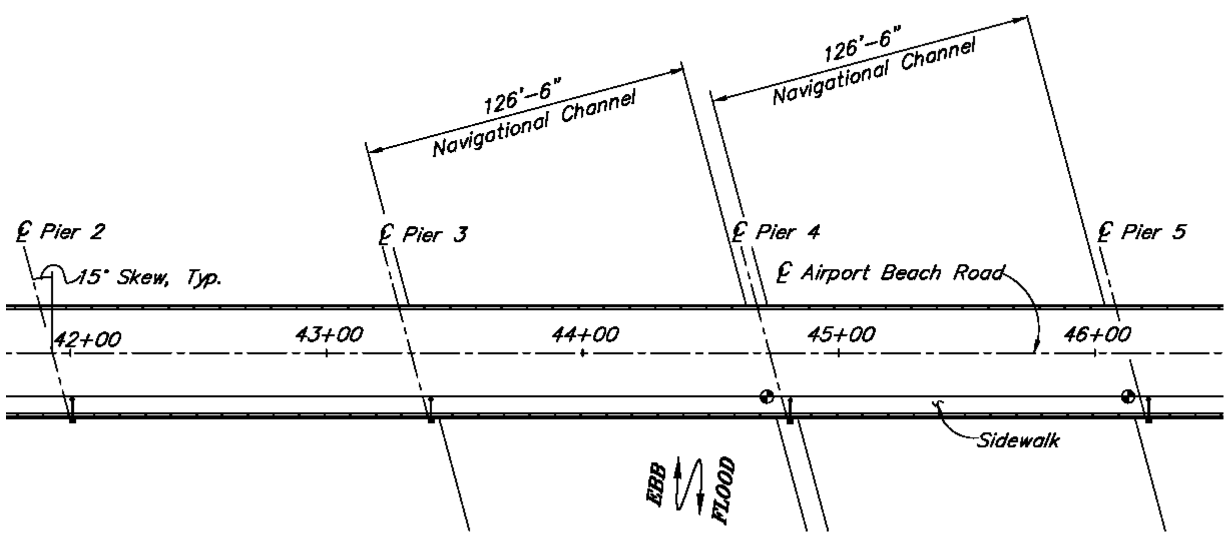


Figure 122. Bridge plan view indicating multiple navigation channel width dimensions to substructure units in the waterway. (Source: Alaska DOT)

Bridge with navigation channel designated by cross-hatched area. Substructure units within the waterway. Report 135.6.

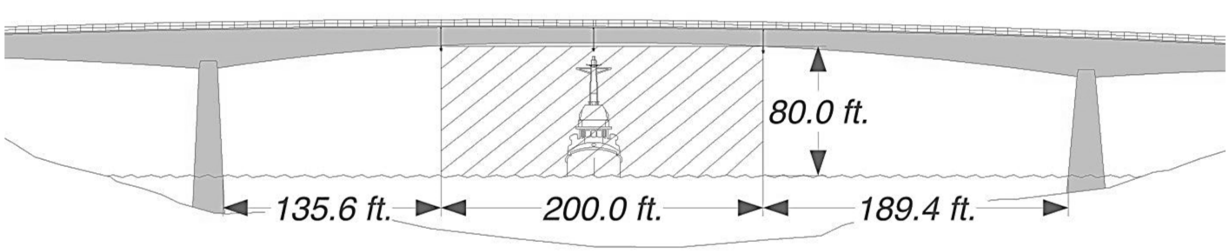


Figure 123. Bridge elevation view indicating navigation channel clearances to substructure units in the waterway.

Substructure Navigation Protection

Format	Frequency	Item ID
AN (1)	EI	B.N.06

Specification	Commentary
Report the presence and adequacy of substructure navigation protection for the waterway feature reported in Item B.F.01 *(Feature Type),* using one of the following codes. Code / Description 0 — Navigation protection not required; bridge has been designed or assessed to have adequate capacity to resist anticipated impact loads without collapse. 1 — Navigation protection not required; assessment of navigation opening and vessel traffic has determined that there is a low probability that an errant vessel could impact the bridge. 2 — Protective system in place and functioning. 3 — Protective system in place, but damage or deterioration impacts ability to protect. 4 — Protective system in place, but reevaluation of design suggested. 5 — No protective system in place, but reevaluation of the need for a protective system is recommended. Report this item only when Item B.N.01 *(Navigable Waterway)* is Y.	Substructure navigation protection systems can be fender systems, dolphins, or other systems that either prevent the substructure from being impacted or adequately reduce the impact load that is transferred into the substructure. Use codes 0 and 1 to indicate that an assessment of vessel traffic characteristics and/or bridge capacity has determined that navigation protection is not required. AASHTO's Guide Specifications and Commentary for Vessel Collision Design of Highway Bridges provides a method for assessing an existing bridge's vulnerability to vessel collision. Codes 0 and 1 should not be assigned based on field observation. Use codes 4 and 5 to indicate that observed conditions necessitate a review of vessel traffic characteristics, bridge capacity, and protective system capability to determine whether the bridge is adequately protected from vessel collision.

Example Navigable Waterway Data for Bridge Number 15558X

The bridge carries North Hanley Road over Wabash Avenue, Burlington Northern/Santa Fe (BNSF) Railroad, and Berkeley Branch Coldwater Creek. The design plans do not identify a navigation channel and there is no correspondence in the bridge file indicating that the Coast Guard exercises jurisdiction over navigation on the waterway.

Figure 124. Berkeley Branch Coldwater Creek below Bridge Number 15558X.

Since Item B.N.01 *(Navigable Waterway)* is coded N, the remaining items in this subsection are not reported.

Table 13. Navigable Waterway data items in the Features Data Set for Bridge Number 15558X.

Item ID	**Data Item**	**Value**
B.N.01	*Navigable Waterway*	N
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*	

SECTION 5: LOADS, LOAD RATING, AND POSTING

This section has data items that have been grouped by the following three subsections: Loads and Load Rating, Load Posting Status, and Load Evaluation and Posting.

The data items in the Loads and Load Rating subsection provide information on the load carrying capacity of bridges, as well as the method used to determine the capacity and load posting. These items are considered part of the Primary Data Set and have a one-to-one relationship with a bridge. Some of the data items remain static once a bridge has been inventoried, but others may change after reevaluation of the load rating.

The data items in the Load Posting Status subsection provide information on the status of the bridge with regards to weight or other load restrictions. These items are considered part of the Posting Status Data Set and have a many-to-one relationship with a bridge when applicable. The data for these items may change after reevaluation of the load rating.

The data items in the Load Evaluation and Posting subsection provide information on the load carrying capacity the bridge with respect to the legal load configurations established by AASHTO. These items are considered part of the Posting Evaluation Data Set and have a many-to-one relationship with a bridge when applicable. The data for these items may change after reevaluation of the load rating.

The following data items are included in this section.

SUBSECTION 5.1: LOADS AND LOAD RATING

SUBSECTION 5.2: LOAD POSTING STATUS

SUBSECTION 5.3: LOAD EVALUATION AND POSTING

SUBSECTION 5.1: LOADS AND LOAD RATING

The data items in this subsection provide information on the load carrying capacity of the bridge, as well as the method used to determine the capacity and load posting. These data items are considered part of the Primary Data Set and have a one-to-one relationship with a bridge. Some of the data items remain static once a bridge has been inventoried, but others may change after reevaluation of the load rating.

The following data items are included in this subsection.

Item ID	**Data Item**
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

Design Load

Format	Frequency	Item ID
AN (8)	I	B.LR.01

Specification	Commentary
Report the live load for which the bridge was designed using one of the following codes. Code — Description H10 — H-10 H15 — H-15 H20 — H-20 HS15 — HS-15 HS20 — HS-20 HS20M — HS-20 and Military HS20Plus — Greater than HS-20 HL93 — HL-93 HL93Plus — Greater than HL-93 RR — Railroad U — Unknown X — Other	For widened or rehabilitated bridges, code the most restrictive design load governing any portion of the bridge. Use code HS20M when the bridge is designed to accommodate both the HS-20 and the alternate military load. Use codes HS20Plus and HL93Plus when the HS-20 or HL-93 design load configuration is increased proportionally above that specified in the AASHTO design specifications. Use code U when the design plans are not available and the likely design load cannot be inferred from design characteristics of the bridge or agency policy at the time the bridge was built. A code other than U can be reported when design plans are not available, but the design load can be inferred from design characteristics of the bridge or agency policy at the time the bridge was built. Use code X when the design is not based on AASHTO design load configurations.

Example

A bridge designed for an HS-20 load is later widened. The widening is designed for the HL-93 load. Report HS20.

Per State design policy, a bridge is designed using LRFD, in which the truck load portion of the HL-93 load is increased by 25%. Report HL93Plus.

Per State design policy, a bridge is designed for the HL-93 design load, with further consideration of a State-defined permit vehicle. The permit vehicle controls the design of the superstructure. Report X.

Design Method

Format	Frequency	Item ID
AN (4)	I	B.LR.02

Specification	Commentary
Report the method by which the bridge was designed using one of the following codes. Code — Description ASD — Allowable Stress Design LFD — Load Factor Design LRFD — Load and Resistance Factor Design U — Unknown X — Other	The 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)*. Use code U 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. 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.

Example

A bridge designed for an HS-20 load using Load Factor design is later widened. The widened portion is designed for the HL-93 load using Load and Resistance Factor design. Item B.LR.01 *(Design Load)* has code HS20 reported. Report LFD.

Load Rating Date

Format	Frequency	Item ID
YYYYMMDD	I	B.LR.03

Specification	Commentary
Report the date of the most recent load rating. Do not report this item if no rating analysis or evaluation has been performed	This item reflects the date of the most recent calculation or reevaluation of the load rating. 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. 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)*

Example
Load rating calculations found in the bridge record are dated September 5, 1999. Report 19990905. A bridge rated for an HS-20 load using Load Factor rating is later widened. The entire bridge is re-rated using Load and Resistance Factor rating on July 23, 2012. Report 20120723.

Load Rating Method

Format	Frequency	Item ID
AN (4)	I	B.LR.04

Specification	Commentary
Report the method used to calculate the load rating using one of the following codes. Code — Description LFR — Load Factor Rating ASR — Allowable Stress Rating LRFR — Load and Resistance Factor Rating LT — Load Testing AR — Assigned Rating EJ — Field evaluation and documented engineering judgment N — No rating analysis or evaluation has been performed	When different portions of a bridge are load rated using different methods, report the rating method associated with the controlling rating factor. For information on applicable load rating methods, refer to the October 30, 2006 FHWA memorandum at: http://www.fhwa.dot.gov/bridge/nbis/103006.cfm. For information on using code AR, refer to the September 29, 2011 FHWA memorandum at: http://www.fhwa.dot.gov/bridge/110929.cfm For information on using code EJ, refer to the February 2, 2011 FHWA memorandum at: http://www.fhwa.dot.gov/bridge/110202.cfm

Example

A bridge rated for an HS-20 load using Load Factor rating is later widened. The entire bridge is re-rated using Load and Resistance Factor rating. Report LRFR.

A steel truss bridge with steel beam approach spans originally rated using Allowable Stress Rating. The approach spans are re-rated using Load Factor Rating due to deterioration. The rating of the approach spans controls. Report LFR.

A bridge designed and checked using Load Factor Design and an HS-20 live load. The bridge meets the criteria stated in the September 29, 2011 FHWA memo and has an assigned load rating. Report AR.

A concrete bridge constructed in 1910 has no design plans. Load rating determined by a qualified engineer after field condition and live load history evaluation. Report EJ.

Inventory Load Rating Factor

Format	Frequency	Item ID
N (4,2)	I	B.LR.05

Specification	Commentary
Report the inventory load rating factor, truncated to the hundredth, for the standard AASHTO HS-20 or HL-93 loadings, whichever is applicable based on the method reported in Item B.LR.04 *(Load Rating Method)*. When temporary or supported conditions exist, as indicated in Item B.PS.01 *(Load Posting Status)*, report the rating factor for the bridge including the temporary or supported conditions. Do not report this item when no rating analysis or evaluation has been performed.	For LRFR, this is the rating factor for the design load rating at the inventory level of reliability using the HL-93 loading considering all applicable strength and serviceability limit states. Refer to the AASHTO Manual for Bridge Evaluation for details of HS-20 and HL-93 loadings.

Example
A bridge has a calculated inventory load rating factor of 1.486. Report 1.48.

Operating Load Rating Factor

Format	Frequency	Item ID
N (4,2)	I	B.LR.06

Specification	Commentary
Report the operating load rating factor, truncated to the hundredth, for the standard AASHTO HS-20 or HL-93 loadings, whichever is applicable based on the method reported in Item B.LR.04 *(Load Rating Method)*. When temporary or supported conditions exist, as indicated in Item B.PS.01 *(Load Posting Status)*, report the rating factor for the bridge including the temporary or supported conditions. Do not report this item when no rating analysis or evaluation has been performed.	For LRFR, this is the rating factor for the design load rating at the operating level of reliability using the HL-93 loading considering all applicable strength and serviceability limit states. Refer to the AASHTO Manual for Bridge Evaluation for details of HS-20 and HL-93 loadings.

Example

A bridge has a calculated operating load rating factor of 1.679. Report 1.67.

Controlling Legal Load Rating Factor

Format	Frequency	Item ID
N (4,2)	I	B.LR.07

Specification	Commentary
Report the lowest (controlling) rating factor for the State's and AASHTO legal loads truncated to the hundredth. When temporary or supported conditions exist, as indicated in Item B.PS.01 *(Load Posting Status)*, report the rating factor for the bridge including the temporary or supported conditions. Do not report this item when no rating analysis or evaluation has been performed.	For LRFR this would be the "Legal Load Rating", a second level rating that provides a single safe load capacity (for a given truck configuration) applicable to AASHTO and State legal loads. For LRFR, when all State legal loads are enveloped by the HL-93 design loading and the design load rating factor at the operating level is greater than or equal to 1.0, then the value in Item B.LR.06 *(Operating Load Rating Factor)* can be reported for this item in lieu of calculating a "Legal Load Rating." For allowable stress and load factor rating this would be the operating load rating factor for the State's legal loads. If all State legal loads are enveloped by the design loading and the operating rating is greater than or equal to 1.0, then the value in Item B.LR.06 *(Operating Load Rating Factor)* can be reported for this item. State legal loads would typically be described in State laws (State vehicle codes).

Example

A bridge has the following calculated legal load rating factors for the AASHTO legal loads and a State-defined legal load:

Legal Load Configuration	Rating Factor
Type 3	1.07
Type 3S2	0.88
Type 3-3	0.80
SU4	0.70
SU5	0.65
FL120	1.15

Report 0.65.

Routine Permit Loads

Format	Frequency	Item ID
AN (1)	I	B.LR.08

Specification	Commentary
Report whether the bridge carries routine permit loads or whether routine permit loads are restricted from the bridge using one of the following codes. Code — Description 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. N — Bridge does not carry routine permit loads. Agency does not issue routine permits.	This item is 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. 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. Use code C when the agency issues routine permits, but all routine permit loads are restricted from the bridge. Use code N when the agency does not issue routine permits and therefore the bridge does not carry routine permit loads.

Example Loads and Load Rating Data for Bridge Number 15558X

The bridge was designed for the HS-20 load using Allowable Stress Design. The bridge was rerated on February 14, 2016 using the load factor rating method to assess Specialized Hauling Vehicles. The calculated inventory rating factor was 0.30 and the operating rating factor was 0.50. The controlling legal load rating factor was 0.44 for the SU7 truck. Routine permit vehicles are not permitted to cross the bridge.

Table 14. Loads and Load Rating data items in the Primary Data Set for Bridge Number 15558X.

Item ID	Data Item	Value
B.LR.01	*Design Load*	HS20
B.LR.02	*Design Method*	ASD
B.LR.03	*Load Rating Date*	20160214
B.LR.04	*Load Rating Method*	LFR
B.LR.05	*Inventory Load Rating Factor*	0.30
B.LR.06	*Operating Load Rating Factor*	0.50
B.LR.07	*Controlling Legal Load Rating Factor*	0.44
B.LR.08	*Routine Permit Loads*	C

SUBSECTION 5.2: LOAD POSTING STATUS

The data items in this subsection provide information on the status of the bridge with regards to weight or other load restrictions, and are considered part of the Posting Status Data Set. These data items have a many-to-one relationship with a bridge.

The posting status of a bridge may change multiple times between data submittals and throughout its service life, such as after reevaluation of the load rating. Data items in this subsection are reported for each change in posting status. Reporting posting status changes that were accepted into the NBI in prior years is not required unless it is found that the accepted data were incomplete or incorrect.

The following data items are included in this subsection.

Item ID	Data Item
B.PS.01	Load Posting Status
B.PS.02	Posting Status Change Date

Load Posting Status

Format	Frequency	Item ID
AN (2)	I	B.PS.01

Specification	Commentary
Report the load posting status of the bridge using one of the codes in *Table 15*.	When temporary or supported conditions exist ensure that data items related to physical characteristics of the bridge (e.g. geometry, clearances, condition, and load rating) represent those characteristics of the temporary or supported bridge. When both a weight and other load restriction exist at the bridge, use the code for the weight restriction (code PP, TP, or SP).

Specification Continued

Table 15. Load Posting Status Codes.

	No restriction			Posted or restricted				Closed
	New	Open	Needs Action	Weight	Other	Needs Reduction	Missing	
Permanent	N	PO	PA	PP	PR	PD	PM	C
Temporary		TO	TA	TP	TR	TD	TM	C
Supported		SO	SA	SP	SR	SD	SM	C

Terms:

Permanent (P) – Permanent bridge in place with no temporary supports.

Temporary (T) – Temporary bridge in place to carry traffic while the permanent bridge is closed and awaiting repair, rehabilitation, or replacement.

Supported (S) – Bridge with temporary shoring, supports, repairs, or supplemental members in place to keep the bridge open pending the completion of active or imminent repair, or replacement projects.

New (N) – Bridge is newly constructed and not yet open to traffic, but is expected to be open within 12 months.

Open (O) – Bridge is open with no restrictions.

Needs Action (A) – Bridge that is open with load posting recommended, but no posting signs in place, or a posting sign that is not legally enforceable.

Weight (P) – Bridge is posted with a weight limit sign or signs.

Other (R) – A posting sign or other traffic control device(s) at the bridge that reduces loading by reducing speed (to reduce impact), limiting the number of lanes or vehicles, or restricting commercial vehicles in general.

Needs Reduction (D) – Bridge is posted, with posting reduction recommended but not implemented.

Missing (M) – Bridge has a legally enforceable load posting and was posted, but one or more required signs are missing or illegible.

Closed (C) – Bridge is closed to all traffic.

Posting Status Change Date		
Format YYYYMMDD	Frequency I	Item ID B.PS.02

Specification	Commentary
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.

Example Load Posting Status Data for Bridge Number 15558X

Figure 125. Approach view with load posting sign for Bridge Number 15558X.

The bridge was posted for load in March 2005 (exact date unknown). Because of the February 14, 2016 load rating and posting evaluation (Value 1), a posting reduction is recommended and the new posting was implemented on April 15, 2016 Value 2). During an inspection on July 23, 2016 one of the posting signs was noted as missing (Value 3). The sign was replaced on September 5, 2016 (Value 4).

Table 16. Load Posting Status data items in the Posting Status Data Set for Bridge Number 15558X.

Item ID	**Data Item**	**Value (1)**	**Value (2)**	**Value (3)**	**Value (4)**
B.PS.01	*Load Posting Status*	PD	PP	PM	PP
B.PS.02	*Posting Status Change Date*	20160214	20160415	20160723	20160905

SUBSECTION 5.3: LOAD EVALUATION AND POSTING

The data items in this subsection provide information on the load carrying capacity of the bridge with respect to the legal load configurations established by AASHTO. These data items are considered part of the Posting Evaluation Data Set and have a many-to-one relationship with a bridge when applicable.

Data items in this subsection are reported for each AASHTO legal load configuration evaluated, only when the bridge has undergone a posting analysis. The data for these items may change after reevaluation of the load rating.

The following data items are included in this subsection.

Item ID	**Data Item**
B.EP.01	Legal Load Configuration
B.EP.02	Legal Load Rating Factor
B.EP.03	Posting Type
B.EP.04	Posting Value

Legal Load Configuration

Format	Frequency	Item ID
AN (3)	I	B.EP.01

Specification	Commentary
Report the configuration of the AASHTO legal load using one of the following codes. Code — Description 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	Refer to the AASHTO Manual for Bridge Evaluation for details of legal loading configurations. For information on the load rating and load posting of emergency vehicles, refer to the November 3, 2016 FHWA memorandum at: *http://www.fhwa.dot.gov/bridge/loadrating/161103.cfm*

Legal Load Rating Factor

Format	Frequency	Item ID
N (4,2)	I	B.EP.02

Specification	Commentary
Report the rating factor for the legal load configuration truncated to the hundredth. When temporary or supported conditions exist, as indicated in Item B.PS.01 *(Load Posting Status)*, report the rating factor for the bridge including the temporary or supported conditions.	For LRFR this would be the “Legal Load Rating”, a second level rating that provides a single safe load capacity for a given AASHTO legal load. For allowable stress and load factor rating this would be the operating load rating factor calculated for a given AASHTO legal load as part of a posting analysis. Refer to the AASHTO Manual for Bridge Evaluation for details of legal loading configurations.

Example
A bridge has a calculated legal load rating factor of 0.926 for the Type 3S2 load. Report 0.92.

Posting Type

Format	Frequency	Item ID
AN (1)	I	B.EP.03

Specification	Commentary
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. Code / Description G Gross Load A Single Axle Load D Tandem Axle Load T Truck Load 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.	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)*.

Examples

Report G.

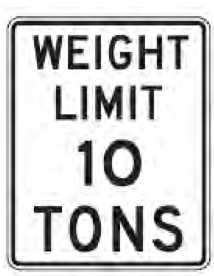


Figure 126. Weight limit sign – gross load.

Report T.

Figure 127. Weight limit sign – truck silhouettes.

<table>
<tr><th colspan="6">Posting Value</th></tr>
<tr><td colspan="2"><u>Format</u>
N (2,0)</td><td colspan="2"><u>Frequency</u>
I</td><td colspan="2"><u>Item ID</u>
B.EP.04</td></tr>
<tr><th colspan="3">Specification</th><th colspan="3">Commentary</th></tr>
<tr><td colspan="3">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.

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.</td><td colspan="3">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).</td></tr>
<tr><th colspan="6">Example</th></tr>
<tr><td colspan="3">Report 10.

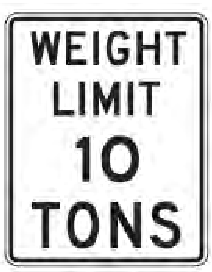


Figure 128. Weight limit sign – gross load (10T).</td><td colspan="3">Report 8 for Type 3.

Report 12 for Type 3S2.

Report 16 for Type 3-3.

Figure 129. Weight limit sign – truck silhouettes (8T, 12T, and 16T).</td></tr>
</table>

Example Load Evaluation and Posting Data for Bridge Number 15558X

The February 14, 2016 load rating and posting evaluation calculated the following legal load rating factors and vehicle posting weights for the AASHTO legal load configurations.

	Type 3	Type 3S2	Type 3-3	SU4	SU5	SU6	SU7
Rating Factor	0.66	0.69	0.77	0.58	0.53	0.48	0.44
Vehicle Weight (ton)	25	36	40	27	31	34.45	38.75
Posting Weight (ton)	16.6	25.1	30.9	15.7	16.5	16.7	17.3

The bridge was posted on April 15, 2016 with an MUTCD R12-5 weight limit sign:

Figure 130. View of MUTCD R12-5 weight limit sign for Bridge Number 15558X.

No separate sign is used to post for specialized hauling vehicles beyond the single unit configuration on the R12-5 sign. There was no evaluation for the EV2 or EV3 emergency vehicles. Therefore, nothing is reported for those configurations.

Table 17. Load Evaluation and Posting data items in the Load Evaluation Data Set for Bridge Number 15558X.

Item ID	**Data Item**	**Value (1)**	**Value (2)**	**Value (3)**	**Value (4)**	**Value (5)**	**Value (6)**	**Value (7)**
B.EP.01	*Legal Load Configuration*	3	3S2	3-3	SU4	SU5	SU6	SU7
B.EP.02	*Legal Load Rating Factor*	0.63	0.66	0.74	0.56	0.51	0.46	0.43
B.EP.03	*Posting Type*	T	T	T	T	T	T	T
B.EP.04	*Posting Value*	15	25	30	15	15	15	15

SECTION 6: INSPECTIONS

This section has data items that have been grouped by the following two subsections: Inspection Requirements and Inspection Events.

The data items in the Inspection Requirements subsection provide information about non-routine inspection types required, and special inspection features of the bridge. These items are considered part of the Primary Data Set and have a one-to-one relationship with a bridge. The data for items in this subsection typically remain static once a bridge has been inventoried.

The data items in the Inspection Events subsection provide information about each inspection performed for the bridge. These items are considered part of the Inspections Data Set and have a many-to-one relationship with a bridge. This subsection also has a data item for reporting inspection equipment used during an inspection. This data item is considered part of the Inspection Equipment Data Set and has a many-to-one relationship with an Inspection Event. The data for these items change with each inspection.

The following data items are included in this section.

SUBSECTION 6.1: INSPECTION REQUIREMENTS

Item ID	Data Item
B.IR.01	NSTM Inspection Required
B.IR.02	Fatigue Details
B.IR.03	Underwater Inspection Required
B.IR.04	Complex Feature

SUBSECTION 6.2: INSPECTION EVENTS

Item ID	Data Item
B.IE.01	Inspection Type
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

SUBSECTION 6.1: INSPECTION REQUIREMENTS

The data items in this subsection provide information about required non-routine inspection types, and special inspection features of the bridge, and are considered part of the Primary Data Set. These data items have a one-to-one relationship with a bridge. The data for these items typically remain static once a bridge has been inventoried.

The following data items are included in this subsection.

Item ID	Data Item
B.IR.01	NSTM Inspection Required
B.IR.02	Fatigue Details
B.IR.03	Underwater Inspection Required
B.IR.04	Complex Feature

NSTM Inspection Required

Format	Frequency	Item ID
AN (1)	I	B.IR.01

Specification	Commentary
Report whether the bridge requires an NSTM inspection using one of the following codes. Code — Description N — NSTM inspection not required. Y — NSTM inspection required. I — NSTM inspection not required – Internal Redundancy S — NSTM inspection not required – System Redundancy 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)*.	The intent of this item is to identify bridges that require NSTM inspection for any part of the bridge, to ensure they are inspected in accordance with the NBIS. It is the State's option to record a required NSTM inspection for any bridges meeting a State definition more rigorous than the FHWA definition of NSTM inspection. Use code N when an NSTM inspection is not required and codes I and S do not apply. Use code I when the bridge owner has demonstrated to FHWA, through the use of nationally recognized methods, that a member without load path redundancy is internally redundant, and it is determined that the bridge does not require an NSTM inspection. Use code S when the bridge owner has demonstrated to FHWA, through the use of nationally recognized methods, that a bridge without load path redundancy is system redundant, and it is determined that the bridge does not require an NSTM inspection.

Fatigue Details

Format	Frequency	Item ID
AN (1)	I	B.IR.02

Specification	Commentary
Report whether the bridge has AASHTO fatigue category E or E' details using one of the following codes. Code – Description 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)*.	This item provides data to identify bridges that have details most prone to fatigue. Refer to the BIRM or AASHTO LRFD Bridge Design Specifications for fatigue categories.

Underwater Inspection Required

Format	Frequency	Item ID
AN (1)	I	B.IR.03

Specification	Commentary
Report whether an underwater inspection is required under normal flow conditions using one of the following codes. Code Description N Underwater inspection not required Y Underwater inspection required Do not report this item for bridges that do not pass over water as indicated in Item B.F.01 *(Feature Type)*.	The intent of this item is to identify bridges that require an underwater inspection per the NBIS. Use code Y when during a typical routine inspection, any portion of a bridge substructure and the surrounding channel cannot be inspected to the mudline at low water by wading or probing, generally requiring diving or other appropriate technique. Use code N when during a typical routine inspection, all portions of a bridge substructure and the surrounding channel can be inspected to the mudline at low water by wading or probing. If this item was previously reported as Y because an underwater inspection is generally required, it should continue to be reported as Y 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. This applies only if the low flow condition is truly unusual and is not likely to reoccur during the next inspection interval. The reported code for this item may change in the rare circumstance where long-term environmental conditions change for inspection access to underwater portions of the substructure.

Complex Feature

Format	Frequency	Item ID
AN (1)	I	B.IR.04

Specification	Commentary
Report whether the bridge has a complex feature by using one of the following codes. Code Description N Bridge does not have complex feature Y Bridge has complex feature	The intent of this item is to identify bridges with complex features as defined by the NBIS. Bridges with complex features are typically identified in agency policies and procedures.

Example Inspection Requirement Data for Bridge Number 15558X

The bridge carries North Hanley Road over Wabash Avenue, Burlington Northern/Santa Fe (BNSF) Railroad, and Berkeley Branch Coldwater Creek. The bridge has seven spans with an intermediate hinge in span four.

Main spans one through three are continuous, cast-in-place reinforced concrete voided slabs. Slabs are reinforced with uncoated bars (black bars) and protected with an active cathodic protection system. Slabs have a microsilica modified concrete overlay with a surface penetrating sealer.

Main span four is a cast-in-place reinforced concrete voided slab supported at the far end by cantilever portions of the steel beams extending from span five. Slabs are reinforced with uncoated bars (black bars) and protected with an active cathodic protection system. Slabs have a microsilica modified concrete overlay with a surface penetrating sealer.

Main spans five through seven are continuous, rolled steel beams (W35x135) that are painted. There are nine beam lines in each span. The beams support a cast-in-place, reinforced concrete deck that is reinforced with epoxy coated reinforcing steel. The beams are composite with the deck. The deck has a monolithic, sacrificial concrete wearing surface with a surface penetrating sealer. The deck has no stay-in-place forms.

The bridge does not have NSTMs, does not have category E/E' fatigue details, and is not complex.

The bridge crosses over a concrete lined creek with no substructure units in the creek. An underwater inspection is not required.

Table 18. Inspection Requirement data items in the Primary Data Set for Bridge Number 15558X.

Item ID	Data Item	Value
B.IR.01	*NSTM Inspection Required*	N
B.IR.02	*Fatigue Details*	N
B.IR.03	*Underwater Inspection Required*	N
B.IR.04	*Complex Feature*	N

SUBSECTION 6.2: INSPECTION EVENTS

The data items in this subsection provide information about each inspection performed for the bridge, and are considered part of the Inspections Data Set. These data items have a many-to-one relationship with a bridge.

Data items in this subsection are reported for each inspection performed on the bridge. If more than one type of inspection is performed on a given inspection date, a separate inspection data set is reported for each inspection type performed. This uniquely identifies reported information for multiple inspection types that may occur during a calendar year or between submittals of data to FHWA. Reporting inspection events that were accepted into the NBI in prior years is not required unless it is found that the accepted data were incomplete or incorrect. To correct previously submitted inspection event data for a given inspection date and type, report a new complete inspection event data set representative of that event that includes the originally submitted data for Items B.IE.01 *(Inspection Type)* and B.IE.02 *(Inspection Begin Date).*

The following data items are included in this subsection.

Item ID	Data Item
B.IE.01	Inspection Type
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

Inspection Type

Format	Frequency	Item ID
AN (1)	EI	B.IE.01

Specification	Commentary
Report the inspection type or scour monitoring performed using one of the following codes. Code — Description 1 Initial 2 Routine 3 Underwater 4 NSTM 5 Damage 6 In-Depth 7 Special 8 Service 9 Scour Monitoring	Use code 2 when all portions of a bridge substructure and the surrounding channel have been inspected to the mudline at low water visually, or by wading or probing during routine inspections. Use code 3 when all portions of a bridge substructure reported Y for Item B.IR.03 *(Underwater Inspection Required)* is inspected by wading and probing in an instance of unusually low flow. If this is performed during a Routine inspection, record both a routine and underwater inspection. Use code 9 when scour monitoring is performed as required by a Scour POA for a triggering storm event. This can include periodic remote electronic readings of streambed changes when required in the POA. If multiple site visits occur for a triggering storm event, record this item once for that storm event. Use code 8 when a Service Inspection is performed for a bridge with a risk-based routine inspection interval that exceeds 48 months.

Examples

The initial inspection of a widened bridge. Report 1.

An inspection, scheduled every twelve months, of an entire bridge that is in poor condition. Report 2.

An unscheduled inspection to assess the damage resulting from a vehicular impact. Report 5.

An inspection to perform a hands-on inspection of pins using non-destructive testing methods. Report 6.

An inspection to use non-destructive testing methods to assess the condition of the cables (complex feature) of a cable-stayed bridge. Report 6.

An inspection of only the girders (controlling members) of a load restricted bridge. Report 7.

Inspection Begin Date

Format	Frequency	Item ID
YYYYMMDD	EI	B.IE.02

Specification	Commentary
Report the date for the inspection type performed. For multiple day inspections, record the first day that field inspection begins.	The intent of this item is to record the inspection dates for the inspection types in Item B.IE.01 *(Inspection Type)*, since the previous data submittal to FHWA. If multiple site visits occur for scour monitoring inspections, for a triggering storm event, report the first site visit date for that storm event.

Examples

For Bridge 0004794A:

A Routine and NSTM inspection started on August 1, 2020.

- Report 20200801 for the Routine inspection.
- Report 20200801 for the NSTM inspection.

An Underwater inspection started on August 31, 2020. Report 20200831.

The bridge was struck by an over-height vehicle on November 22, 2020 requiring a Damage inspection on the same day. Report 20201122.

The damage in the example above was repaired, and a one-time Special inspection of the repair was performed on December 23, 2020. Report 20201223.

Inspection Completion Date

Format	Frequency	Item ID
YYYYMMDD	EI	B.IE.03

Specification	Commentary
Report the completion date for the inspection type performed. For single day inspections, report the same date that field inspection begins.	The intent of this item is to record the field inspection completion dates for all inspections. If multiple site visits occur for scour monitoring inspections, for a triggering storm event, report the last site visit date for that storm event.

Examples

A Routine and NSTM inspection started on August 1, 2020. The Routine inspection was completed on August 2, 2020, and the NSTM inspection was completed on August 4, 2020.

- Report 20200802 for the Routine inspection.
- Report 20200804 for the NSTM inspection.

An Underwater inspection started on August 31, 2020 and completed on September 1, 2020. Report 20200901.

Nationally Certified Bridge Inspector

Format	Frequency	Item ID
AN (15)	EI	B.IE.04

Specification	Commentary
Report the unique code identifying the Nationally Certified Bridge Inspector (team leader) responsible for the inspection type performed.	The intent of this item is to indicate the Nationally Certified Bridge Inspector (team leader) present at the inspection, for each inspection type required by the NBIS. 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.

Examples

A Routine (53DJS007 team leader) and NSTM (53DMO003 team leader) inspection started on August 1, 2020.

- Report 53DJS007 for the Routine inspection.
- Report 53DMO003 for the NSTM inspection.

An Underwater inspection (53WFC004 team leader) was performed on August 31, 2020. Report 53WFC004.

Inspection Interval

Format	Frequency	Item ID
N (2,0)	EI	B.IE.05

Specification	Commentary
Report the planned interval in number of months between the current and next scheduled inspection for the type associated with Items B.IE.01 *(Inspection Type)* and B.IE.03 *(Inspection Completion Date)* items. Report 0 for damage inspections, scour monitoring inspections, or when a special inspection does not have a defined inspection interval.	The intent of this item is to record the planned interval at which the bridge is to be inspected per the NBIS and agency policies and procedures. This interval should be evaluated after each inspection, and adjusted as necessary.

Examples

A Routine and NSTM inspection started on August 1, 2020. The Routine inspection is on an approved 48-month extended interval, but after the inspection it was determined the interval be adjusted to 24 months due to worsening structural deterioration. The NSTM inspection is on a 24-month interval.

- Report 24 for the Routine inspection.
- Report 24 for the NSTM inspection.

An Underwater inspection was performed on August 31, 2020. The Underwater inspection is on a 72-month extended interval. Report 72.

Inspection Due Date

Format	Frequency	Item ID
YYYYMMDD	C	B.IE.06

Specification	Commentary
Do not report this item as it is calculated by the FHWA. 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)*.	The intent of this item is to provide the inspection due date for the inspection types defined in the B.IE.01 *(Inspection Type)* where applicable. This item is only calculated for inspection types which have an inspection interval.

Risk-Based Inspection Interval Method

Format	Frequency	Item ID
AN (1)	EI	B.IE.07

Specification	Commentary
Report the risk-based inspection interval method using one of the following codes. Code / Description N — Not applicable 1 — Method 1 2 — Method 2	The intent of this item is to record the risk-based inspection interval method, described in the NBIS, for determining the inspection interval. Method 1, as described in the NBIS, is 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, as described in the NBIS, is 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. Use code N when Item B.IE.01 *(Inspection Type)* is 1, 5, 6, 7, 8 or 9.

Inspection Quality Control Date

Format	Frequency	Item ID
YYYYMMDD	EI	B.IE.08

Specification	Commentary
Report the date that the QC review was completed. Do not report when a QC review was not performed.	The intent of this item is to identify inspections that have had independent QC reviews to maintain inspection quality at or above a specified level. Agency QC procedures often vary, and 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.

Examples

A Routine and NSTM inspection started on August 1, 2020. The Routine inspection was completed on August 2, 2020. The NSTM inspection was completed on August 4, 2020. An agency QC review was performed on the Routine and NSTM inspections on September 15, 2020.

- Report 20200915 for the Routine inspection.
- Report 20200915 for the NSTM inspection.

The bridge above was then struck by an over-height vehicle on November 22, 2020 requiring Damage inspection. The damage was repaired, and a one-time Special inspection of the repair was performed on December 23, 2020. No agency QC review was performed on the Damage and Special inspections.

- Do not report this item for the Damage inspection.
- Do not report this item for the Special inspection.

Inspection Quality Assurance Date

Format	Frequency	Item ID
YYYYMMDD	EI	B.IE.09

Specification	Commentary
Report the date that the QA review was completed. Do not report when a QA review was not performed.	The intent of this item is to identify inspections that have had independent QA reviews to measure or verify the overall quality of the inspection program. Agency QA procedures often vary in the 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.

Example
A Routine and NSTM inspection started on August 1, 2020. The Routine inspection was completed on August 2, 2020. The NSTM inspection was completed on August 4, 2020. An agency QC review was performed on the Routine and NSTM inspections on September 15, 2020. The Routine inspection was randomly selected for an agency QA review according to agency policies and procedures, which was performed on January 4, 2021. Report 20210104 for the Routine inspection.

Inspection Data Update Date

Format	Frequency	Item ID
YYYYMMDD	EI	B.IE.10

Specification	Commentary
Report the date that the NBI inspection data were entered or updated in the State transportation department, Federal agency, or Tribal government inventory.	The intent of this item is to verify that a complete NBI inspection data set is accepted and is entered or updated in the inventory within the timeframes required by the NBIS.

Example

A Routine and NSTM inspection started on August 1, 2020. The Routine inspection was completed on August 2, 2020, and the NSTM inspection was completed on August 4, 2020. An agency QC review was performed on the Routine and NSTM inspections on September 15, 2020. The agency database was updated on September 16, 2020 for the Routine and NSTM inspections.

- Report 20200916 for the Routine inspection.
- Report 20200916 for the NSTM inspection.

Inspection Note

Format	Frequency	Item ID
AN (300)	EI	B.IE.11

Specification	Commentary
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.	This item is intended 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. This item is also used to describe the purpose for Special inspections performed following extreme events such as floods, hurricanes, and earthquakes.

Examples

A NSTM inspection was performed, including hands-on inspection of all girders and floor beams in spans 2 and 3.

- Report "Hands-on inspection of all girders and floor beams in spans 2 and 3."

An Underwater inspection was performed on August 31,2020 with divers for piers 4-7 during a period of low water.

- Report "Dove piers 4-7 at low water, with deficiencies in the splash zone noted and photographed. Team leaders 034 and 116 both participated, but TL 116 was the team leader in charge."

The bridge was struck by an over-height vehicle on November 22, 2020 requiring a Damage inspection.

- Report "East portal and bracing given a hands-on inspection via bucket truck; mag-particle testing used in several locations where a crack was suspected."

The damage was repaired, and a one-time Special inspection of the repair was performed on December 25, 2020.

- Report "East portal and bracing given a hands-on inspection via bucket truck."

A scour critical bridge experienced flood water elevations up to the web of the exterior girder. Per the scour POA, scour monitoring was immediately completed by a team leader.

- Report "Bridge was visually monitored for damage and alignment issues during flooding."

Inspection Equipment

Format	Frequency	Item ID
AN (120)	EI	B.IE.12

Specification	Commentary
Report all access and inspection equipment used to perform the inspection using one or more of the following codes. Report multiple codes separated by pipe (|) delimiters. Do not report this item if none of the equipment below was used. Code Description Access AN No access equipment used A01 Ladder A02 Bucket lift vehicle A03 Under bridge inspection vehicle A04 Rigging A05 Waders A06 Boat A07 Snorkel A08 SCUBA A09 Surface supplied air A10 Remotely Operated Vehicle (ROV) A11 Video pole A12 Borescope A13 Unmanned aerial systems (UAS) A14 Service Traveler AX Other Codes continued next page.	This item is used to provide information about access and inspection equipment used in addition to standard equipment for each inspection. Remotely operated vehicles include any remotely controlled device used to provide video access to members of a bridge via ground, water surface, or underwater. Use code AN when none of the listed access equipment codes apply for the inspection performed. Use code A13 when unmanned aerial systems (UAS), also referred to as drones, are used to supplement inspections. Use code IN when none of the listed inspection equipment codes apply for the inspection performed. Use code I13 when underwater imaging technologies such as side scan sonar are used to supplement underwater inspections. NDE and testing inspection equipment listed represent only more common or general types. Use the most closely related code, or use code IX for types not listed.

Specification Continued – Inspection Equipment	
Code	Description
	Inspection
IN	No inspection equipment used
I01	Ultrasonic
I02	Ground-penetrating radar
I03	Infrared thermography
I04	Radiographic testing
I05	Impact echo
I06	Electromagnetic methods
I07	Rebound & penetration methods
I08	Acoustic emissions testing
I09	Dye penetrant
I10	Magnetic particle
I11	Eddy current
I12	Boring or drilling
I13	Underwater imaging
I14	Depth finder/fathometer
I15	Stress wave timer
IX	Other

Example – Inspection Equipment

A NSTM inspection was performed, including hands-on inspection of all girders and floor beams in spans 2 and 3. An under bridge inspection vehicle was used to gain access and magnetic particle testing was done to check fatigue details for cracking.

- Report A03|I10 for the NSTM inspection.

An underwater inspection was performed with divers using a boat and surface supplied air. Before the dive, side-scan sonar was performed to capture underwater images.

- Report A06|A09|I13 for the underwater inspection.

The bridge was struck by an over-height vehicle requiring a damage inspection. A hands-on inspection was performed using a bucket truck for access. Dye penetrant testing was used in several locations where cracks were suspected. The tip of identified cracks was determined using Eddy Current testing.

- Report A02|I09|I11 for the damage inspection.

A scour critical bridge experienced flood water elevations up to the web of the exterior girder. Per the scour POA, scour monitoring was immediately completed by a team leader. A remotely operated water vehicle was used that was equipped with underwater imaging technology.

- Report A10|I13 for the scour monitoring inspection.

Example Inspection Events Data for Bridge Number 15558X

A Routine inspection was performed on the bridge that began March 17, 2016 and was completed on March 18, 2016. Ken F. Faster was the team leader for the Routine inspection. His agency assigned him a unique code (29KFF007) identifying him as a Nationally Certified Bridge Inspector. The Routine inspection interval established for this bridge is 24 months, using agency policy and Method 1 in the NBIS. The inspection received a QC review by Ken's supervisor on March 25, 2016 and upon approval, the data were uploaded to the agency's production database. The bridge was selected for a QA review that was completed on March 17, 2017. All portions of the bridge were visually inspected during the Routine inspection using a ladder and video pole for access, and an infrared thermography camera to supplement visual inspection. Since all portions of the bridge were inspected, Item B.IE.11 *(Inspection Note)* does not need to be reported.

A Special inspection was performed on the bridge that began April 1, 2016 and was completed on April 1, 2016. A representative of the active cathodic protection system performed an operational inspection of the system. The representative is not a Nationally Certified Bridge Inspector. Therefore, Item B.IE.4 *(Nationally Certified Bridge Inspector)* is not reported. The Special inspection interval established for this bridge using agency policy is 12 months. The inspection received a QC review by the State Program Manager on April 8, 2016 and upon approval, the data were uploaded to the agency's production database. A QA review was not performed. Since only the active cathodic protection system was inspected for the RC voided slab portions of spans one to four, an inspection note is reported. The representative used a ladder for access and specialized inspection equipment. The system was operational.

Table 19. Inspection Events data items in the Inspections Data Set for Bridge Number 15558X.

Item ID	Data Item	Value (1)	Value (2)
B.IE.01	*Inspection Type*	2	7
B.IE.02	*Inspection Begin Date*	20160317	20160401
B.IE.03	*Inspection Completion Date*	20160318	20160401
B.IE.04	*Nationally Certified Bridge Inspector*	29KFF007	
B.IE.05	*Inspection Interval*	24	12
B.IE.06	*Inspection Due Date* (Calculated by FHWA*)	20180318*	20170401*
B.IE.07	*Risk-Based Inspection Interval Method*	1	N
B.IE.08	*Inspection Quality Control Date*	20160325	20160408
B.IE.09	*Inspection Quality Assurance Date*	20170317	
B.IE.10	*Inspection Data Update Date*	20160325	20160408
B.IE.11	*Inspection Note*		Inspected active cathodic protection system on spans 1 to 4. System operational.
B.IE.12	*Inspection Equipment*	A1|A11|I3	A1|IX

SECTION 7: BRIDGE CONDITION

This section has data items that have been grouped by the following five subsections: Component Condition Ratings, Element Identification, Element Conditions, Appraisal, and Work Events.

The data items in the Component Condition Ratings subsection provide information about the condition of the bridge and waterway(s). These items are considered part of the Primary Data Set and have a one-to-one relationship with a bridge. The data for these items may change after each inspection.

The data items in the Element Identification subsection provide information about the elements present on the bridge, and the total quantity of each element as defined in the AASHTO MBEI. The data for these items typically remain static once a bridge has been inventoried. The data items in the Element Conditions subsection provide information about the condition of bridge elements as defined in the AASHTO MBEI. The data for these items may change after each inspection. Element data are only required to be reported to FHWA for bridges that carry NHS routes, while reporting is optional for bridges that carry non-NHS routes. These items are considered part of the Elements Data Set and have a many-to-one relationship with a bridge when applicable.

The data items in the Appraisal subsection provide information about potential bridge vulnerabilities. These items are considered part of the Primary Data Set and have a one-to-one relationship with a bridge. The data for these items typically remain static once a bridge has been inventoried.

The data items in the Work Events subsection provide information about the year the bridge was built, and subsequent work performed on the bridge. Item B.W.01 *(Year Built)* is considered part of the Primary Data Set and has a one-to-one relationship with a bridge. Items B.W.02 *(Year Work Performed)* and B.W.03 *(Work Performed)* are considered part of the Work Data Set and have a many-to-one relationship with a bridge. The data for these items may change periodically as work is completed for a bridge.

The following data items are included in this section.

SUBSECTION 7.1: COMPONENT CONDITION RATINGS

SUBSECTION 7.1: COMPONENT CONDITION RATINGS

The data items in this subsection provide condition information for the bridge and waterway(s) and are considered part of the Primary Data Set. These data items have a one-to-one relationship with a bridge. The data for these items may change after each inspection.

The following data items are included in this subsection.

Item ID	**Data Item**
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

Items B.C.12 *(Bridge Condition Classification)* and B.C.13 *(Lowest Condition Rating Code)* are calculated by FHWA using data from other items in the SNBI. The data item pages explain how these items are calculated and recorded in the NBI, and are presented for reference only. These items are not intended to be reported by an inspector or designated agency personnel. Therefore, the wording of the specifications and commentary is different (passive voice) than for other items (active voice) in this subsection.

Condition ratings indicate the existing field conditions of the bridge components and waterway. A condition rating code must therefore consider the type, location, and severity of the defects; the extent to which they exist throughout the item being evaluated; and the degree to which the defects affect strength and/or performance of the bridge or component.

Determine the condition rating codes for the bridge components (Items B.C.01 through B.C.07) by correlating field observations with Table 20. The remaining condition ratings (Items B.C.08 through B.C.11) can be determined using the tables embedded in the item descriptions. These tables define the condition ratings in terms of defect severity, extent, and effect on strength and/or performance of the bridge or component. The term “defect”, used in these tables indicates a problem with the bridge component that may be caused by deterioration, damage, or an inherent defect.

As used in the condition rating tables, an inherent defect is not indicative of damage or deterioration, but is characteristic of the material or results from normal construction practices. A minor defect is one where damage or deterioration has initiated but is not yet considered significant. A moderate defect is one where damage or deterioration are significant, but the strength and performance of the component are not affected. A major defect affects the strength and/or performance of the component, as determined by a structural and/or hydraulic review. For joints, bearings, railings, and railing transitions, a major defect prevents the component from functioning as intended.

A defect is considered widespread when it is present in many separate areas of the component, while an isolated defect occurs in one or a few concentrated locations. The term “some” is used when the defect prevalence is more than isolated and less than widespread.

Load posting alone, for an existing bridge designed for less than current legal loads, is not considered a defect and does not affect the condition rating code.

Evaluate portions of bridge components that are supported or strengthened by temporary members also considering the condition of the temporary members.

Optional tables provided in Appendix C give additional guidance on various defects and deterioration mechanisms.

Use Table 20 to determine condition rating codes for the bridge component items in this section (Items B.C.01 through B.C.07). The entire code description must be satisfied for the code to apply.

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.
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.

Deck Condition Rating

Format	Frequency	Item ID
AN (1)	EI	B.C.01

Specification	Commentary
Report the deck component condition rating using one of the codes in *Table 20*. Report N when Item B.SP.09 *(Deck Material and Type)* is 0.	This item represents the condition of the deck as determined from the inspection of all deck surfaces (top, underside, and edges). Visual assessments may be supplemented with non-destructive or destructive testing results.

Commentary Continued

Use destructive or non-destructive testing results or visual condition indicators of materials covering the surfaces being assessed when top, underside or both surfaces are not visible for assessment. Past inspection reports and repair records may also provide supplemental information to aid in the determination of the condition rating.

Do not consider the condition of non-monolithic wearing surfaces (i.e. overlays), stay-in-place deck forms, joint assemblies, expansion devices, bridge rails, or scuppers when determining the condition rating code for this item, except insofar as they indicate the condition of the deck itself.

Consider the condition of a joint header only when the deck serves as a joint header.

For bridges with integral decks/top flanges (e.g. rigid frames, decked girders or tee beams, voided slab beams, box girders, etc.), the deck condition may affect the superstructure condition rating; however, the superstructure condition does not affect the deck condition rating.

The deck and superstructure condition ratings are the same for slab bridges.

Example – Deck Condition Rating

Reinforced concrete (RC) bridge deck approximately 270’ long x 40’ wide with the following noted defects.

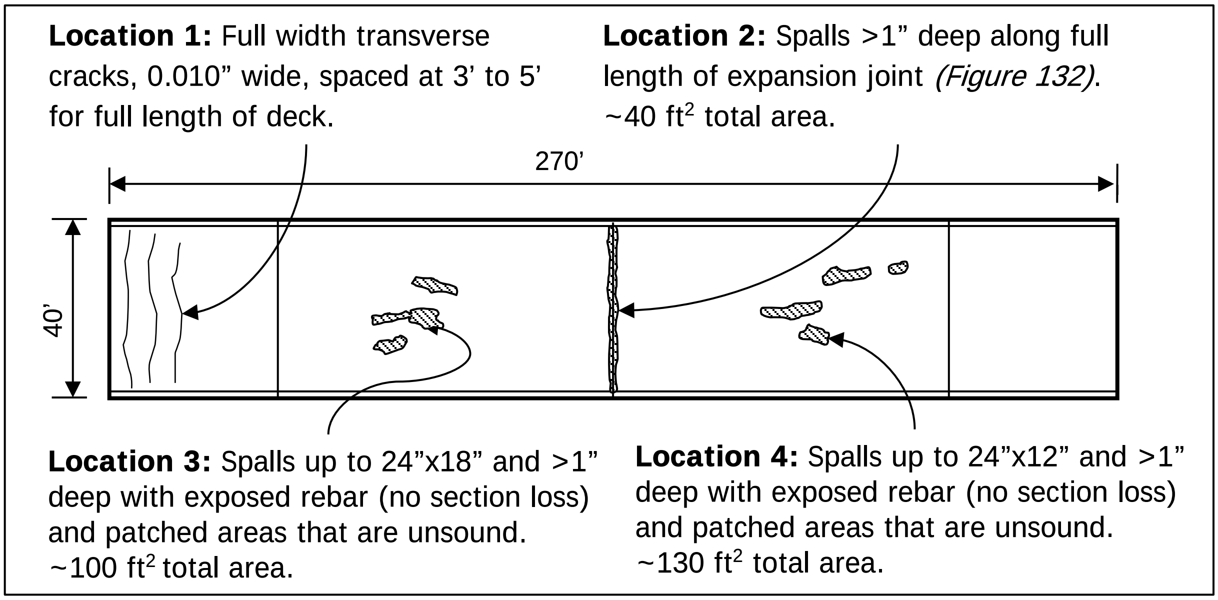


Figure 131. Deck plan view showing defects.

Figure 132. Deck spalling along joint. Location 2.

Figure 133. Typical deck spall with exposed rebar. Locations 3 and 4.

Example Continued – Deck Condition Rating

Summary of Findings:

Location	Defect(s)	Severity	Extent
1	Cracking	Inherent	Throughout (widespread)
2	Spalling	Moderate	~ 40 ft^2 (isolated)
3	Spalling with exposed rebar, patched area that is unsound	Moderate	~ 100 ft^2 (isolated)
4	Spalling with exposed rebar, patched area that is unsound	Moderate	~ 130 ft^2 (isolated)

Results: There are several areas of isolated moderate defects that can best be characterized together as "some moderate defects." The rest of the deck surface has inherent defects. There are no defects visible on the underside of the deck, and none of the observed defects appear to indicate more significant problems. The deck is best characterized as having "some moderate defects." Report 5.

Superstructure Condition Rating

Format	Frequency	Item ID
AN (1)	EI	B.C.02

Specification	Commentary
Report the superstructure component condition rating using one of the codes in *Table 20*. Report N when M, A, or W is not reported for Item B.SP.01 *(Span Configuration Designation)*.	This item represents the condition of the superstructure as determined from the inspection of all superstructure members.

Commentary Continued

Consider primary load carrying members when determining the condition rating code for this item, which includes cross-frames and diaphragms for curved girder bridges. Consider secondary members only if they adversely impact the primary members. Visual assessments may be supplemented with non-destructive or destructive testing results.

The superstructure includes:

- members above the bearings for bridges with non-integral superstructure and substructure;
- girders/beams for integral superstructures;
- members above the spring line for arch bridges;
- slabs of concrete rigid frame bridges; and
- legs, knees and girders for concrete and steel rigid K-Frame or Delta-Frame bridges.

Consider the condition of integral headwalls and wingwalls to the first expansion joint.

Do not consider the condition of bearings when determining the condition rating code for this item except to the extent that the bearings are causing distress in the superstructure.

Do not consider the condition of protective coating systems when determining the condition rating code for this item except to the extent that problems with the protective coating system are indicative of problems with the underlying superstructure material. A well-formed patina on weathering steel is considered a protective coating and is not considered a defect.

Do not consider the presence of drift, debris, and soil accumulation when determining the condition rating code for this item, except to the extent that these items are causing distress in the superstructure.

Superstructure types without substructures may be affected by scour. When observed conditions are not consistent with the scour design or the assumptions used in the scour appraisal, scour is considered when reporting the code for this item. In this case, observed conditions also indicate a need to reevaluate Item B.AP.03 *(Scour Vulnerability)*. Observed scour that is less than the tolerable limit determined in the scour appraisal does not affect this item.

Commentary Continued – Superstructure Condition Rating
For structures with integral decks/top flanges (e.g. rigid frames, decked girders or tee beams, voided slab beams, box girders, etc.), the deck condition may affect the superstructure condition rating; however, the superstructure condition does not affect the deck condition rating. The deck and superstructure condition ratings are the same for slab bridges.

Examples – Superstructure Condition Rating

Two-span steel truss. Each span is 200' long x 34' wide. The following defects are noted.

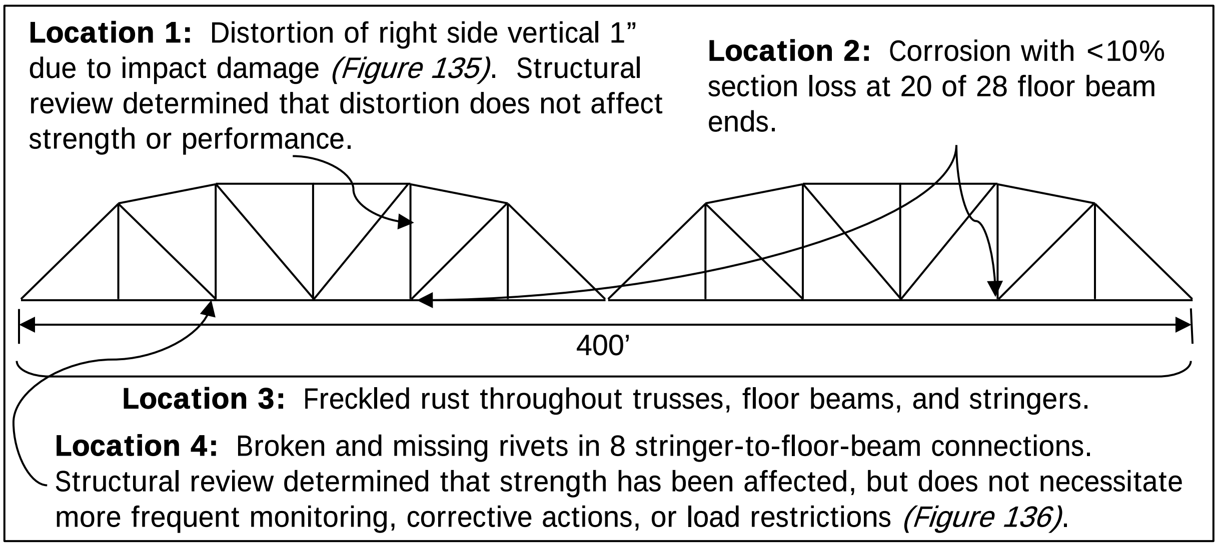


Figure 134. Elevation view of a truss bridge showing superstructure defect locations.

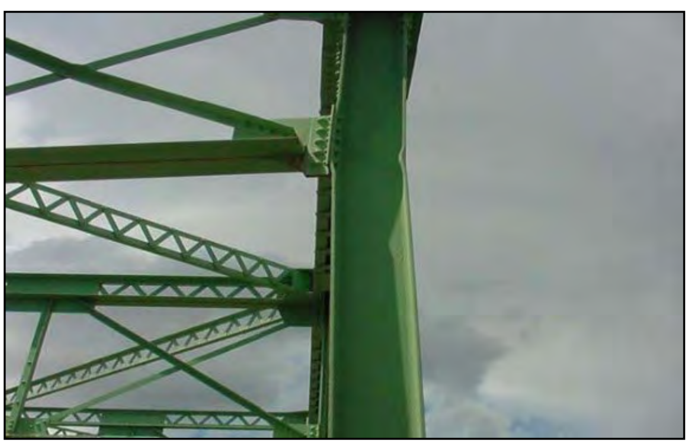


Figure 135. Distortion in truss vertical. Location 1. (Source: Colorado DOT)

Example Continued – Superstructure Condition Rating

Figure 136. Missing rivets in stringer-to-floor-beam connection. Location 4. (Source: Colorado DOT)

Summary of Findings:

Location	Defect(s)	Severity	Extent
1	Distortion	Moderate	One location (isolated)
2	Corrosion with section loss	Moderate	More than a few locations (some)
3	Corrosion	Minor	Throughout (widespread)
4	Connection	Major	A few locations (isolated)

Results: Isolated major defects affecting strength, and some moderate defects that do not affect strength or performance. Therefore, the superstructure is best characterized as having isolated major defects that do not necessitate more frequent monitoring, corrective actions, or load restrictions. Report 4.

Substructure Condition Rating

Format	Frequency	Item ID
AN (1)	EI	B.C.03

Specification	Commentary
Report the substructure component condition rating using one of the codes in *Table 20*. Report N when only C and/or V is reported for Item B.SP.01 *(Span Configuration Designation)*.	This item addresses the condition of piers, abutments, piles, footings, and other substructure members.

Commentary Continued

For bridges that have substructures not visible for inspection, use appropriate visual condition indicators from the superstructure or surrounding foundation materials to determine the applicable code. Visual assessments may be supplemented with non-destructive or destructive testing results.

Consider the condition of integral abutment wingwalls to the first construction or expansion joint when determining the condition rating code for this item.

Do not consider the condition of protective coatings, fenders and other substructure protection systems when determining the condition rating code for this item, except to the extent that these items indicate distress of the substructure, or adversely affect its condition.

Do not consider the presence of drift, debris, and soil accumulation when determining the condition rating code for this item, except to the extent that these items are causing distress in the substructure.

The substructure includes:

- backwalls and the members below the bearings for bridges with non-integral superstructure and substructure;
- members below the girders/beams for integral superstructures;
- thrust blocks and other members below the spring line for arch bridges;
- legs of concrete rigid frame bridges;
- abutments and footings/foundations below the leg bearings for concrete and steel rigid K-Frame or Delta-Frame bridges; and
- foundation piles exposed by erosion or scour.

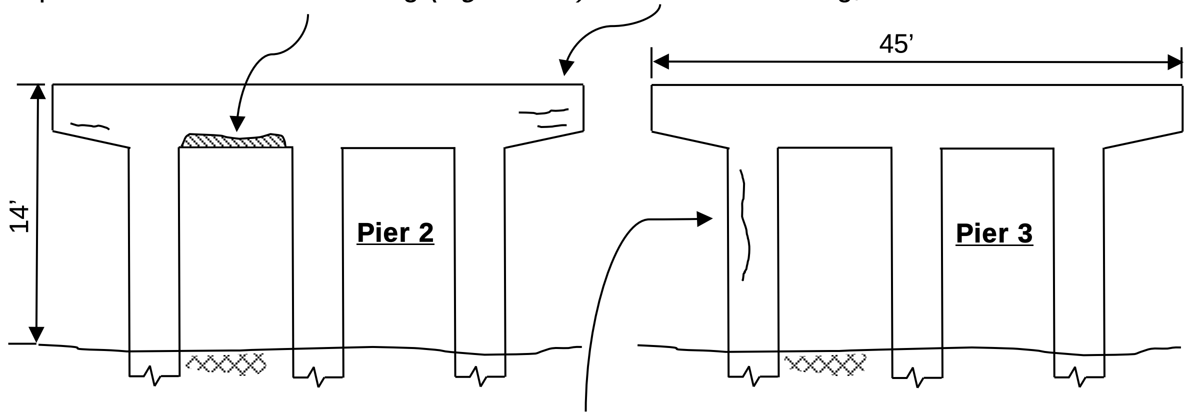
When observed conditions are not consistent with the scour design or the assumptions used in the scour appraisal, scour is considered in the coding of this item. In this case, observed conditions also indicate a need to reevaluate Item B.AP.03 *(Scour Vulnerability)*. Observed scour that is less than the tolerable limit determined in the scour appraisal does not affect this item.

Example – Substructure Condition Rating

Four span prestressed concrete bridge with reinforced concrete abutments and piers. No defects at the abutments or at Pier 1. The following defects are noted at the other piers:

Location 1: Spall 12' long x 2" deep with exposed rebar and rust staining *(Figure 138)*.

Location 2: Cracks 3' long x 0.04" wide with rust staining, both cantilevers.



Location 3: Previously noted crack 11' long x 3/16" wide *(Figure 139)*. Structural review determined that crack does not affect strength or performance.

Figure 137. Elevation view of two concrete column piers showing substructure defect locations.

Figure 138. Spall in Pier 2 cap beam. Location 1.

Figure 139. Crack in Pier 3 column. Location 3.

Summary of Findings:

Location	Defect(s)	Severity	Extent
1	Spall with exposed rebar; rust staining	Moderate	12' of one cap beam (isolated)
2	Cracking with rust staining	Moderate	6' of one cap beam (isolated)
3	Cracking	Moderate	11' crack in one column (isolated)

Results: There are several areas of isolated moderate defects that can best be characterized together as "some moderate defects." Strength and performance of the component are not affected. Report 5.

Culvert Condition Rating

Format	Frequency	Item ID
AN (1)	EI	B.C.04

Specification	Commentary
Report the culvert component condition rating using one of the codes in *Table 20*. Report N when C or V is not reported for Item B.SP.01 *(Span Configuration Designation)*.	This item addresses the condition of culverts. The condition assessment includes footings, piles, and other foundation members when present.

Commentary Continued

For culverts that have components not visible for inspection, use appropriate visual condition indicators from the roadway or surrounding foundation materials to determine the applicable code. Visual assessments may be supplemented with non-destructive or destructive testing results.

Consider the condition of integral wingwalls and headwalls to the first construction or expansion joint when determining the condition rating code for this item.

Do not consider the condition of protective coatings and other culvert protection systems when determining the condition rating code for this item, except to the extent that these items indicate distress of the culvert, or adversely affect its condition.

Do not consider the presence of drift, debris, and soil accumulation when determining the condition rating code for this item, except to the extent that these items are causing distress in the culvert.

The culvert includes:

- buried pipe or box;
- footings below the walls of a 3-sided box; and
- foundation piles exposed by erosion or scour.

When observed conditions are not consistent with the scour design or the assumptions used in the scour appraisal, scour is considered in the coding of this item. In this case, observed conditions also indicate a need to reevaluate Item B.AP.03 *(Scour Vulnerability)*. Observed scour that is less than the tolerable limit determined in the scour appraisal does not affect this item.

Example – Culvert Condition Rating

Three-span corrugated metal pipe culvert. Each pipe is 8' in diameter and 100' long. The pipes are spaced 4' apart. The following defects are noted.

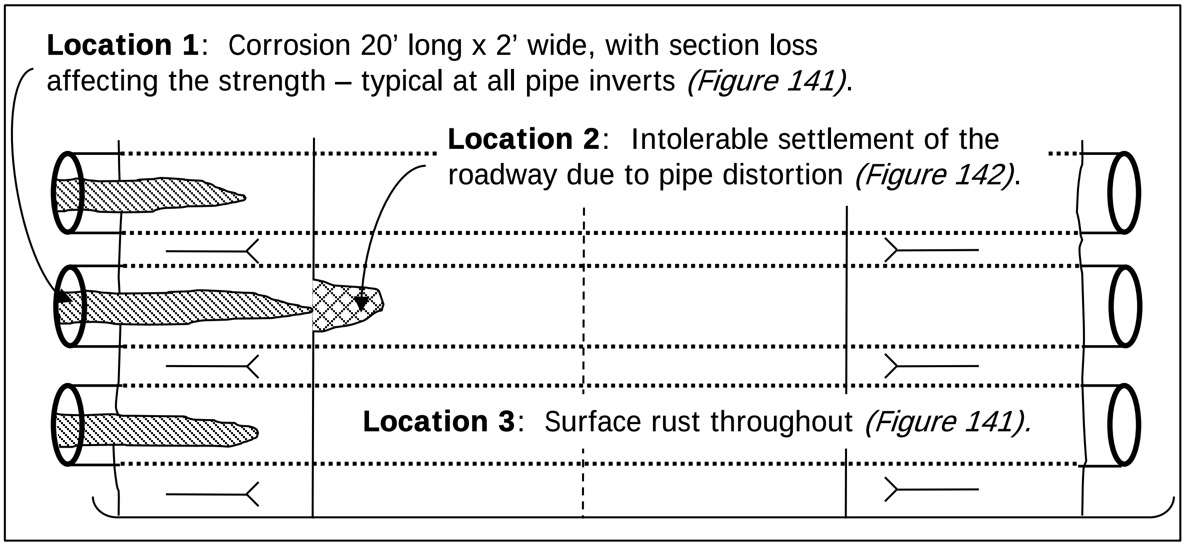


Figure 140. Plan view of pipe culvert showing defects.

Figure 141. Corroded pipe culvert invert. Location 1 and 3. (Source: Alaska DOT)

Figure 142. Roadway settlement over pipe culvert. Location 2. (Source: Alaska DOT)

Example Continued – Culvert Condition Rating

Summary of Findings:

Location	Defect(s)	Severity	Extent
1	Corrosion with section loss	Major	20% of total barrel length (some)
2	Distortion	Major	Isolated
3	Corrosion	Minor	Throughout (widespread)

Results: The culvert has major defects that, together, seriously affect strength and performance. The condition necessitates more frequent monitoring or corrective actions. Report 3.

Bridge Railings Condition Rating

Format	Frequency	Item ID
AN (1)	EI	B.C.05

Specification	Commentary
Report the bridge railing condition rating using one of the codes in *Table 20*. Report N when there are no bridge railings present.	This item 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. The condition assessment includes the portions of the railings, posts, blocking, and curbs that are part of the bridge railing system.

Commentary Continued

Do not consider pedestrian railings when coding this item, 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 when determining the condition rating code for this item, except to the extent that problems with the protective coating system are indicative of problems with the underlying railing material.

Example

Steel W-beam bridge railing on both sides of a 300' long bridge. The following defect is noted:

Description: Damage-induced distortion of the rail for a length of 25'. Three posts are no longer connected to the deck. No other defects.

Defect: Distortion
Severity: Major
Extent: 25' of the railing (isolated)

Figure 143. Collision-induced distortion of bridge railing.

Results: The railing is best characterized as having "isolated major defects." Report 4.

Bridge Railing Transitions Condition Rating

Format	Frequency	Item ID
AN (1)	EI	B.C.06

Specification	Commentary
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.	This item addresses the condition of the transition from the bridge railing to the approach guardrail. The condition assessment includes the portions of the railings, posts, blocking, and curbs that are part of the bridge railing transitions. Do not consider the condition of protective coatings and other protection systems when determining the condition rating code for this item, except to the extent that problems with the protective coating system are indicative of problems with the underlying railing transition material.

Bridge Bearings Condition Rating

Format	Frequency	Item ID
AN (1)	EI	B.C.07

Specification	Commentary
Report the bridge bearing condition rating using one of the codes in *Table 20*. Report N for bridges without bearings.	This item addresses the condition of all types and shapes of bridge bearings. Do not consider the condition of protective coatings and other protection systems when determining the condition rating code for this item, except to the extent that problems with the protective coating system are indicative of problems with the underlying bearing material. In cases where the bearing device is not visible, the condition can be assessed based on alignment, grade across the joint, or other indirect indicators of the condition.

Examples

Description: 5 of 25 bearings have 10% bearing area loss.

Defect: Loss of bearing area
Severity: Moderate
Extent: 20% of bearings (some)

Figure 144. Loss of bearing area for elastomeric bearing. (Source: Oregon DOT)

Results: The bearings are best characterized as having “some moderate defects.” Report 5.

Examples Continued – Bridge Bearings Condition Rating

Description: 8 of 20 bearings are rotated beyond performance limits. The anchor bolts at these locations are bent and the nuts are loose. Surface rust is present on all bearings.

Defect: Alignment and connection
Severity: Major
Extent: 8 bearings (widespread)

Defect: Corrosion
Severity: Minor
Extent: All bearings

Figure 145. Misaligned rocker bearing. (Source: Alaska DOT)

Results: The bearings can best be characterized as having "major defects" affecting performance. Condition necessitates more frequent monitoring or corrective actions. Report 3.

Description: 20 of 20 bearings have surface rust with no section loss. Bearings are free to move and alignment is as expected for temperature conditions.

Defect: Corrosion
Severity: Minor
Extent: All bearings

Figure 146. Surface rust on moveable bearing.

Results: The bearings are best characterized as having "widespread minor defects." Report 6.

Bridge Joints Condition Rating

Format	Frequency	Item ID
AN (1)	EI	B.C.08

Specification

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.
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.

Commentary

This item addresses the condition of all types and shapes of bridge deck joints. The condition assessment includes all aspects of the joints such as any seals, headers (metal or concrete), connections, and other metal members.

When a joint is designed as an open joint, leakage or lack of a seal is not considered a defect.

Do not consider the condition of protective coatings and other protection systems when determining the condition rating code for this item, except to the extent that problems with the protective coating system are indicative of problems with the underlying joint material.

In cases where the joint is not visible, the condition can be assessed based on other indirect indicators of the condition.

Examples – Bridge Joints Condition Rating

Description: All compression seal joints are partially filled with debris, but are still free to move. Seals are intact.

Defect: Debris impaction
Severity: Minor
Extent: All joints (widespread)

Figure 147. Joint partially filled with debris.

Results: The joints are best characterized as having "widespread minor defects." Report 6.

Description: Strip seal joint 44' long at each end of a bridge. 3" deep x 12" wide x 6' long spall with exposed rebar in deck adjacent to joint header. Joint is loose, but functioning. Strip seal is intact. No other defects.

Defect: Adjacent deck or header
Severity: Moderate
Extent: 6' of one joint (isolated)

Figure 148. Spall in joint header. (Source: Colorado DOT)

Results: The joints are best characterized as having "isolated moderate defects." Report 6.

Examples Continued – Bridge Joints Condition Rating

Description: Compression seal joint 56’ long at each end of a bridge. The seal is torn and partially pulled out for the full length of both joints. Performance of the joints is affected.

Defect: Seal damage
Severity: Moderate
Extent: All joints (widespread)

Figure 149. Joint seal is torn and partially pulled out.

Results: The joints can best be characterized as having “widespread moderate defects.” Report 4.

Channel Condition Rating

Format	Frequency	Item ID
AN (1)	EI	B.C.09

Specification

Report the channel 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 cross over water.
9	EXCELLENT	No defects.
8	VERY GOOD	Inherent defects only.
7	GOOD	Some minor defects.
6	SATISFACTORY	Widespread minor or isolated moderate defects.
5	FAIR	Moderate defects; bridge and approach roadway are not threatened.
4	POOR	Widespread moderate or isolated major defects; bridge and/or approach roadway is threatened.
3	SERIOUS	Major defects; bridge or approach roadway is seriously threatened. Condition typically necessitates more frequent monitoring, load restrictions, and/or corrective actions.
2	CRITICAL	Major defects. Bridge or approach roadway is severely threatened. 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 channel condition. Channel rehabilitation may return the bridge to service.
0	FAILED	Bridge is closed due to channel condition, and is beyond corrective action. Bridge location or design can no longer accommodate the channel, and bridge replacement is needed to restore service.

Commentary

This item is used to provide a condition rating for the channel at the bridge. Consider the channel upstream and downstream only insofar as it threatens the bridge and approach roadway.

The condition of channel protection devices is addressed under a separate item. Refer to Item B.C.10 *(Channel Protection Condition Rating)*.

For concrete lined channels, channel defects typically do not apply, except for Aggradation and Debris. The condition of the channel lining would be addressed by Item B.C.10 *(Channel Protection Condition Rating)*.

Examples – Channel Condition Rating

Single span bridge. Channel is aggrading and requires periodic excavation to maintain a tolerable hydraulic opening. The thalweg has migrated such that flow is directed at one abutment (*Figure 150*) and threatens the approach roadway. However, a structural and hydraulic review has determined that the stability of the bridge is not impacted.

Defects: Aggradation and migration
Severity: Moderate
Extent: Widespread

Figure 150. Bridge elevation view of channel condition. (Source: Alaska DOT)

Figure 151. Looking downstream from bridge at excavated material. (Source: Alaska DOT)

Results: The channel can best be characterized as having “widespread moderate defects.” Report 4.

Channel Protection Condition Rating

Format	Frequency	Item ID
AN (1)	EI	B.C.10

Specification

Report the condition of the channel protection device(s) 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 cross over water or channel protection devices do 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; performance of the channel protection is not affected.
4	POOR	Widespread moderate or isolated major defects; performance of channel protection is affected.
3	SERIOUS	Major defects; performance of channel protection is seriously affected. Condition typically necessitates more frequent monitoring or corrective actions.
2	CRITICAL	Major defects; channel protection is severely compromised. Condition typically necessitates more frequent monitoring or corrective actions.
1	IMMINENT FAILURE	Channel protection has failed, but corrective action could restore it to working condition.
0	FAILED	Channel protection is beyond repair and must be replaced.

Commentary

This item is used to provide a condition rating for channel protection devices.

Evaluate the condition and effectiveness of channel protection devices installed on banks or in the stream to mitigate channel issues that may impact the bridge. When reporting this item, consider erosion and scour, damage (unraveling, displacement, separation, and sagging), and material defects (scaling, abrasion, spalling, corrosion, cracking, splitting, and decay).

Channel protection devices are considered countermeasures that control, inhibit, delay, or minimize stream instability and scour problems, including river training and armoring countermeasures.

River training countermeasures may include: spurs, bendway weirs, guide banks, drop structures, and check dams. Additional river training countermeasures can be found in HEC-23 and elsewhere.

Commentary Continued – Channel Protection Condition Rating

Armoring countermeasures may include: rock riprap, grouted riprap, concrete slope paving, articulating concrete blocks, gabion mattresses, and grout-filled mats. Additional armoring countermeasures can be found in HEC-23 and elsewhere.

For bridges that have countermeasures not visible for inspection, use appropriate visual condition indicators to determine the applicable code. These may include measurements taken at the bridge face(s) during every inspection to help determine degree of degradation, aggradation, and/or channel migration.

For this item, a minor defect does not limit the effectiveness of the channel protection, while a moderate defect may limit its effectiveness. A major defect indicates that the channel protection is missing or is no longer effective as determined by a hydraulic review.

Example – Channel Protection Condition Rating

Description: Some stones are missing and revetment has limited effectiveness. Streambed is scouring and undermining the remaining riprap and culvert.

Defects: Scour and damage
Severity: Moderate
Extent: Widespread

Figure 152. Scour and missing riprap at concrete box culvert outlet.

Results: The channel can best be characterized as having “widespread moderate defects.” Performance of the channel protection is affected. Report 4.

Scour Condition Rating

Format	Frequency	Item ID
AN (1)	EI	B.C.11

Specification

Report the scour condition that represents the observed or measured scour using one of the following codes. The entire code description must be satisfied for the code to apply.

Code	Condition Description
N	Bridge does not cross over water.
9	No scour.
8	Insignificant scour.
7	Some minor scour.
6	Widespread minor or isolated moderate scour.
5	Moderate scour; strength and stability of the bridge are not affected.
4	Widespread moderate or isolated major scour; strength and/or stability of the bridge is affected.
3	Major scour; strength and/or stability of the bridge is seriously affected. Condition typically necessitates more frequent monitoring, load restrictions, and/or corrective actions.
2	Major scour; strength and/or stability of the bridge is severely compromised. Condition typically necessitates frequent monitoring, significant load restrictions, and/or corrective actions to keep the bridge open.
1	Bridge is closed to traffic due to scour condition. Channel rehabilitation may return the bridge to service.
0	Bridge is closed due to scour condition, and is beyond corrective action. Bridge replacement is needed to restore service.

Commentary

Refer to Item B.AP.03 *(Scour Vulnerability)* to verify if the bridge has been determined to be stable or unstable for appraised scour conditions.

Consider design scour depth and critical scour depth, commonly found in hydraulic designs, scour evaluations, and POAs, when determining the scour condition ratings.

When observed conditions are not consistent with the scour design or the assumptions used in the scour appraisal, this indicates a need to reevaluate Item B.AP.03 *(Scour Vulnerability)*.

Examples – Scour Condition Rating

Description: Three span scour critical bridge founded on spread footings not on bedrock. The scour elevation for three spread footings at Pier 2 is at the bottom of the footings with one footing having one foot of undermining at one corner. Agency plans to monitor more frequently to keep the bridge open until repairs are completed.

Severity: Major
Extent: 3 of 6 pier footings

Figure 153. Exposed column footing in stream.

Results: The scour condition is best characterized as "major scour" that necessitates more frequent monitoring. Bridge is seriously affected. Report 3.

Description: Scour critical bridge. Critical scour limit was established in the Plan of Action. Inspectors measured the following streambed cross-section *(Figure 154)*.

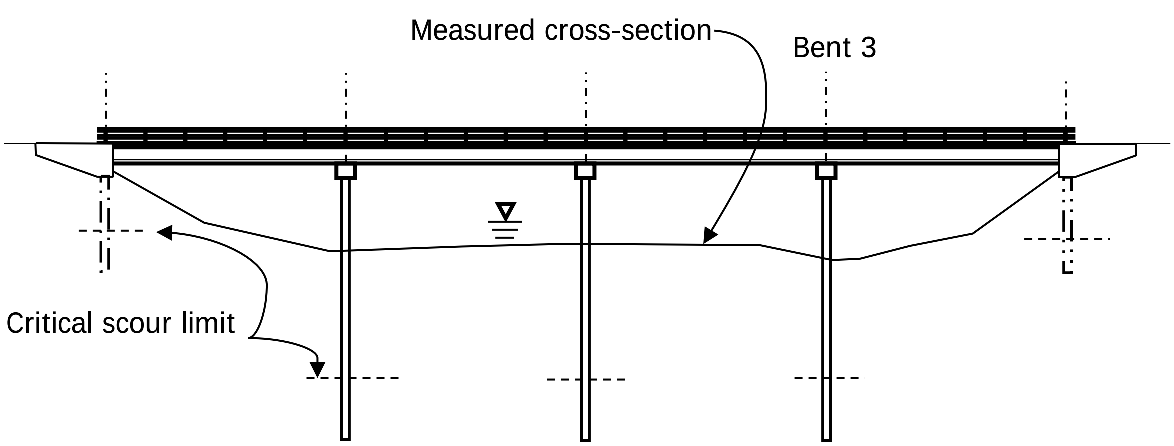


Figure 154. Elevation view showing scour elevations and stream cross-section for a bridge.

Severity: Minor (scour at Bent 3, does not exceed tolerable limit)
Extent: One of five substructure units (Isolated).

Results: The scour condition is best characterized as "isolated minor scour." Report 7.

Examples Continued – Scour Condition Rating

Description: Scour critical bridge. Critical scour limit was established in the Plan of Action. Inspectors measured the following streambed cross-section *(Figure 155)*, which indicates a scour depth at one bent that is below the critical scour elevation.

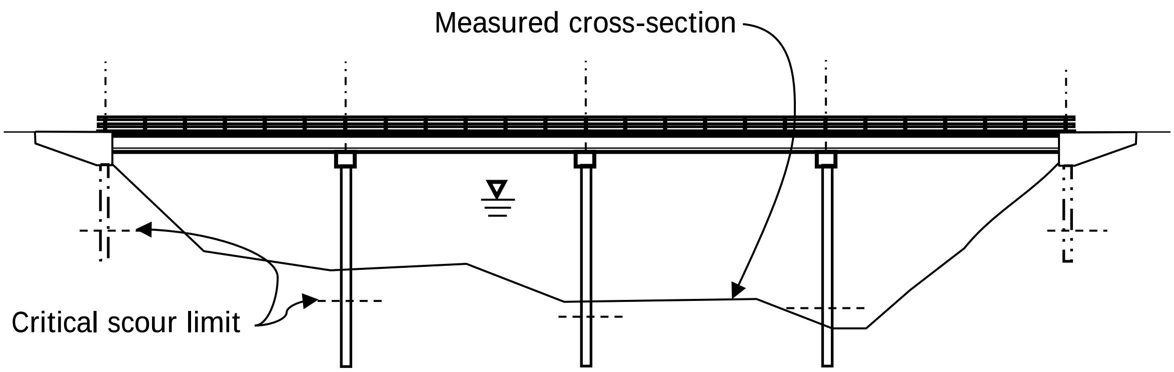


Figure 155. Elevation view showing critical scour limits and stream cross-section for a bridge.

Severity: Moderate
Extent: 2 of 5 substructure units (some)

Severity: Major
Extent: 1 of 5 substructure units (isolated)

Results: The scour condition is best characterized as “major scour”. The bridge is closed until corrective actions are completed. Report 1.

Examples Continued – Scour Condition Rating

Description: Bridge was appraised for scour vulnerability and not considered scour critical. No scour calculations and no structural stability analysis were performed. Piles are end bearing on rock. Inspectors measured the following streambed cross-section, which indicates a scour depth at two piers that is not consistent with the scour assessment assumptions.

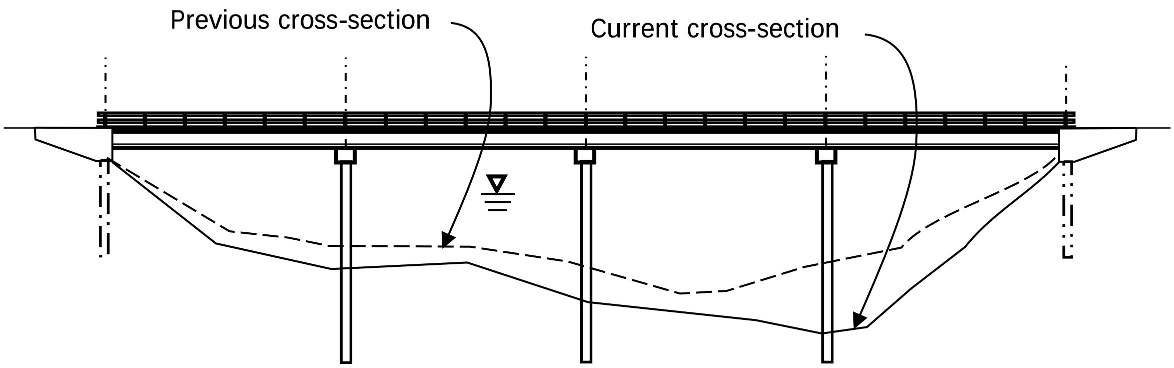


Figure 156. Elevation view showing current cross-section and previous cross-section for a bridge over water.

Severity: Moderate
Extent: 1 of 5 substructure units (isolated)

Severity: Major
Extent: 1 of 5 substructure units (isolated)

Results: The scour condition is best characterized as “isolated major scour”. The defects warrant a structural and/or hydraulic review to determine the effect on strength and/or stability of the bridge. Report 4.

Since observed conditions are not consistent with the scour appraisal assumptions, then scour is considered in the coding of B.C.03 *(Substructure Condition Rating)*. In this case, observed conditions also indicate a need to reevaluate Item B.AP.03 (*Scour Vulnerability*).

Bridge Condition Classification

Format	Frequency	Item ID
AN (1)	C	B.C.12

Specification	Commentary
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.	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:

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.01 *(Deck Condition Rating),*
B.C.02 *(Superstructure Condition Rating),*
B.C.03 *(Substructure Condition Rating),* and
B.C.04 *(Culvert Condition Rating).*

Examples

Code G is calculated and recorded for a reinforced concrete closed-spandrel wall arch bridge with the following component condition rating item codes:

- B.C.02 *(Superstructure Condition Rating)* = 7
- B.C.03 *(Substructure Condition Rating)* = 8

Code F is calculated and recorded for a corrugated metal pipe culvert with the following component condition rating item code:

- B.C.04 *(Culvert Condition Rating)* = 5

Code P is calculated and recorded for a steel box girder bridge with the following component condition rating codes:

- B.C.01 *(Deck Condition Rating)* = 4
- B.C.02 *(Superstructure Condition Rating)* = 6
- B.C.03 *(Substructure Condition Rating)* = 7

Lowest Condition Rating Code

Format	Frequency	Item ID
AN (1)	C	B.C.13

Specification	Commentary
This item is 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)*, and B.C.04 *(Culvert Condition Rating).*	

Examples

Code 7 is calculated and recorded for a reinforced concrete closed-spandrel wall arch bridge with the following component condition rating item codes:

- B.C.02 *(Superstructure Condition Rating)* = 7
- B.C.03 *(Substructure Condition Rating)* = 8

Code 5 is calculated and recorded for a corrugated metal pipe culvert with the following component condition rating item code:

- B.C.04 *(Culvert Condition Rating)* = 5

Code 4 is calculated and recorded for a steel box girder bridge with the following component condition rating codes:

- B.C.01 *(Deck Condition Rating)* = 4
- B.C.02 *(Superstructure Condition Rating)* = 6
- B.C.03 *(Substructure Condition Rating)* = 7

NSTM Inspection Condition		
Format AN (1)	Frequency EI	Item ID B.C.14

Specification	Commentary
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.	This item 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).

Underwater Inspection Condition

Format	Frequency	Item ID
AN (1)	EI	B.C.15

Specification	Commentary
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.	This item represents the condition of underwater members identified to be inspected in the underwater inspection procedures, and incorporated into the substructure condition rating. If this item has previously been 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. This 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.

Example Component Condition Ratings Data for Bridge Number 15558X

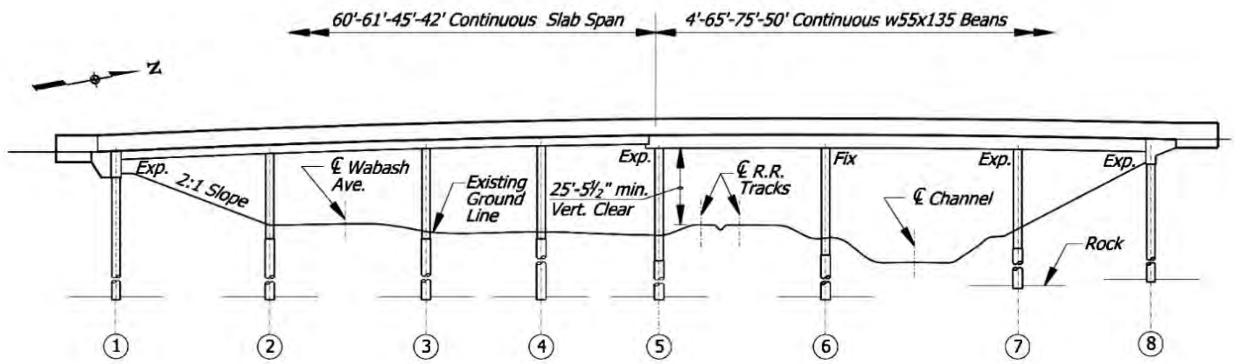


Figure 157. Elevation view indicating substructure unit numbers for Bridge Number 15558X. (Source: Missouri DOT)

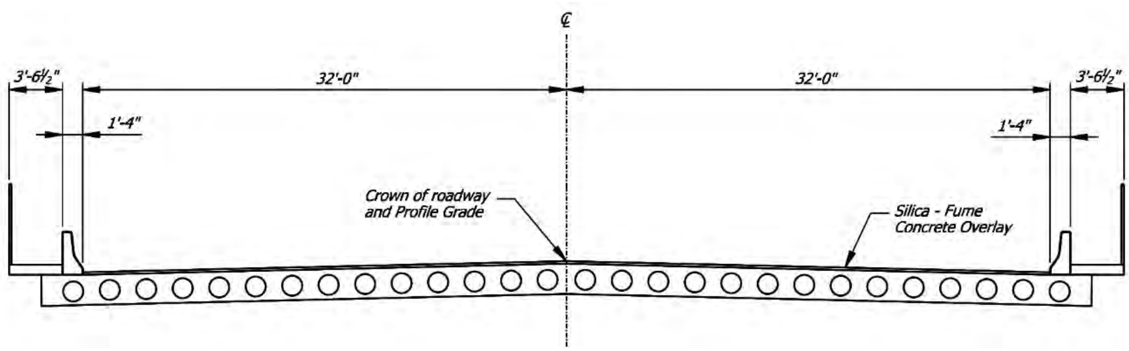


Figure 158. Cross-section view of RC voided slab spans one to four for Bridge Number 15558X. (Source: Missouri DOT)

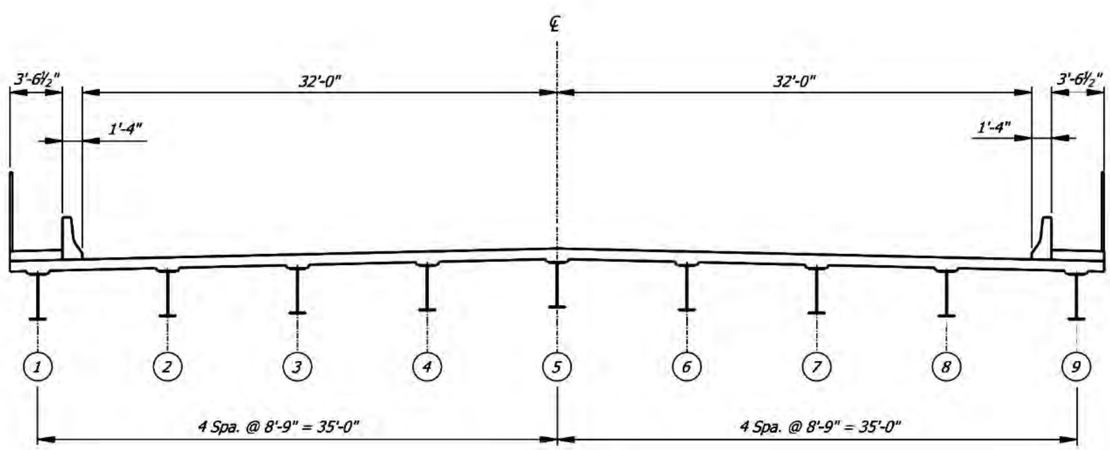


Figure 159. Cross-section view, looking north, indicating steel beam numbering in spans five to seven for Bridge Number 15558X. (Source: Missouri DOT)

Deck Condition Rating: The top surface has pattern cracking typical throughout. Medium width cracks (0.03" to 0.05" wide) spaced 1' to 3' *(Figure 160)*. There are medium width (0.03" to 0.05" wide) diagonal cracks at the corners.

Figure 160. Transverse cracking in top of RC deck for Bridge Number 15558X.

The underside has medium width (0.02” to 0.04” wide) transverse cracks spaced at 3’ throughout with surface white efflorescence and no rust staining *(Figure 161)*. Typical on steel beam spans.

Figure 161. Transverse cracking with efflorescence on underside of RC deck for Bridge Number 15558X.

There are medium width (0.03” to 0.05” wide) longitudinal cracks in the microsilica modified concrete overlay spaced 1’ to 3’ *(Figure 162 and Figure 163)*. Typical on RC voided slab spans.

Figure 162. Longitudinal cracking in wearing surface for Bridge Number 15558X.

Figure 163. Closer view of cracking in wearing surface for Bridge Number 15558X.

The deck is characterized as having widespread minor defects. Report 6 for Item B.C.01 *(Deck Condition Rating)*.

Superstructure Condition Rating: Steel beams have isolated locations of spot surface corrosion and peeling paint near mid-span diaphragms *(Figure 164)*.

Figure 164. Spot surface corrosion on steel beams for Bridge Number 15558X.

Cantilever ends of the steel beams have surface corrosion, but no measurable section loss *(Figure 165)*.

Figure 165. Surface corrosion on cantilever steel beam ends for Bridge Number 15558X.

RC voided slab has six spalled areas at the center construction joint with exposed rebar; largest spall (5' x 1' x 2") has nine transverse and two longitudinal exposed rebars. Rebars have surface rust, but no measurable section loss *(Figure 166)*. There are various delaminated areas throughout the east half. There are medium width (0.03" to 0.05" wide) longitudinal cracks typical throughout east half with efflorescence and rust present at many locations.

Figure 166. Spalls with exposed rebar on underside of RC voided slab for Bridge Number 15558X.

Unsound patches exist along the east edge at the south abutment. Unsound patches also exist near the joint between the RC voided slab and steel beams.

Figure 167. Unsound patched areas and efflorescence on underside of RC voided slab for Bridge Number 15558X.

The superstructure is characterized as having some moderate defects. Report 5 for Item B.C.02 *(Superstructure Condition Rating)*.

Substructure Condition Rating: The south abutment has medium width (0.03" to 0.05") vertical and horizontal cracks typical throughout the abutment and backwall with efflorescence and rust staining *(Figure 168)*.

Figure 168. Cracking in south RC abutment for Bridge Number 15558X.

Bent 5 has delaminated areas on the south face of the bent cap on the west end. Bent 6 has a small spall and delaminated areas near the base on the west side. Bent 7 has medium width (0.02" to 0.05") vertical cracks in the west column *(Figure 169)*.

Figure 169. Cracking in RC column at Bent 7 for Bridge Number 15558X.

The north abutment has medium width (0.03" to 0.05" wide) vertical cracks and moderate map cracking in the northwest corner with efflorescence and rust staining. There are insignificant width (0.010" wide) vertical cracks in the semi-integral RC end diaphragm and insignificant width diagonal cracks under the beams *(Figure 170)*. There are medium width horizontal cracks under Beam 9.

Figure 170. Cracking in north RC abutment for Bridge Number 15558X.

The substructure is characterized as having isolated moderate defects. Report 6 for Item B.C.03 *(Substructure Condition Rating)*.

Culvert Condition Rating: The bridge is not a culvert. Report N for Item B.C.04 *(Culvert Condition Rating).*

Bridge Railings Condition Rating: There are isolated instances of vertical, insignificant width cracks (width less than 0.012”) with surface white efflorescence.

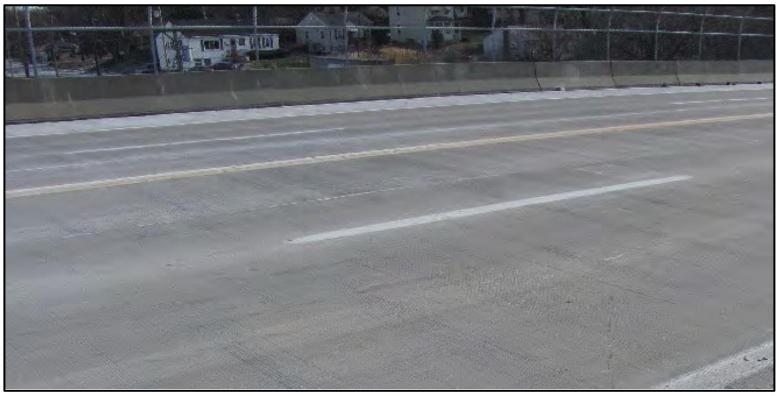


Figure 171. Typical RC bridge railing condition for Bridge Number 15558X.

The bridge railings are characterized as having isolated minor defects. Report 7 for Item. B.C.05 *(Bridge Railings Condition Rating)*.

Bridge Railing Transitions Condition Rating: There are two loose fasteners that connect the thrie-beam to the RC railing at each transition. Each transition also has isolated spot surface corrosion *(Figure 172)*.

Figure 172. Typical condition of thrie-beam bridge transition railing for Bridge Number 15558X.

The bridge railing transitions are characterized as having isolated minor defects. Report 7 for Item B.C.06 *(Bridge Railing Transitions Condition Rating).*

Bridge Bearings Condition Rating: There is pack rust on masonry plates below rockers for all eight bearings at the south abutment. Bearing movement is restricted based on temperature at the time of inspection. There is no evidence of distress in the adjoining slab superstructure.

Figure 173. Typical rocker bearing with movement restricted by pack rust for Bridge Number 15558X.

All nine pot bearings supporting the RC voided slab on the cantilever portion of the steel beams have surface corrosion, but are functioning as intended. No defects noted for the remaining 54 bearings.

Figure 174. Typical pot bearings with surface rust for Bridge Number 15558X.

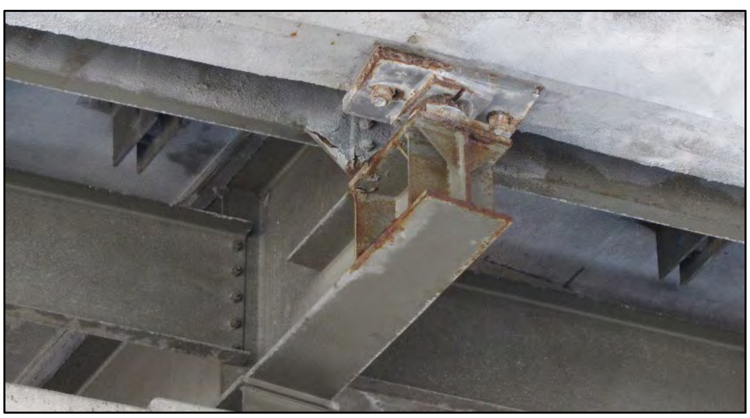


Figure 175. Closer view of typical pot bearings with surface rust for Bridge Number 15558X.

The bridge bearings are characterized as having isolated major defects. Report 4 for Item B.C.07 *(Bridge Bearings Condition Rating)*.

Bridge Joints Condition Rating: The seal is ripped and punctured completely through along the entire strip seal joint between the steel span and RC voided slab span.

Figure 176. Strip seal bridge joint for Bridge Number 15558X.

Figure 177. Strip seal ripped and punctured completely through for Bridge Number 15558X.

The bridge joint is characterized as having widespread major defects. Report 2 for Item B.C.08 *(Bridge Joints Condition Rating)*.

Channel: There are large deposits of debris with heavy vegetation in the creek *(Figure 178)*. The creek is characterized as having moderate defects. Report 5 for Item B.C.09 *(Channel Condition Rating)*.

Figure 178. RC lined channel with debris and vegetation for Bridge Number 15558X.

Channel Protection Condition Rating: There are medium width cracks (0.02” to 0.05”) spaced greater than 3’ throughout the walls of the RC channel lining *(Figure 178)*. The channel protection is characterized as having widespread minor defects. Report 6 for Item B.C.10 *(Channel Protection Condition Rating)*.

Scour Condition Rating: There is no scour observed. The channel has a RC liner. Report 9 for Item B.C.11 *(Scour Condition Rating)*.

Bridge Condition Classification: FHWA calculated Item B.C.12 *(Bridge Condition Classification).*

Lowest Condition Rating Code: FHWA calculated Item B.C.13 *(Lowest Condition Rating Code)*.

NSTM Inspection Condition: The bridge does not require an NSTM inspection. Do not report Item B.C.14 *(NSTM Inspection Condition)*.

Underwater Inspection Condition: The bridge does not require an underwater inspection. Do not report Item B.C.15 *(Underwater Inspection Condition)*.

Table 21. Component Condition Ratings data items in the Primary Data Set for Bridge Number 15558X.

Item ID	Data Item	Value
B.C.01	*Deck Condition Rating*	6
B.C.02	*Superstructure Condition Rating*	5
B.C.03	*Substructure Condition Rating*	6
B.C.04	*Culvert Condition Rating*	N
B.C.05	*Bridge Railings Condition Rating*	7
B.C.06	*Bridge Railing Transitions Condition Rating*	7
B.C.07	*Bridge Bearings Condition Rating*	4
B.C.08	*Bridge Joints Condition Rating*	2
B.C.09	*Channel Condition Rating*	5
B.C.10	*Channel Protection Condition Rating*	6
B.C.11	*Scour Condition Rating*	9
B.C.12	*Bridge Condition Classification (Determined by FHWA*)*	F*
B.C.13	*Lowest Condition Rating Code (Determined by FHWA*)*	5*
B.C.14	*NSTM Inspection Condition*	
B.C.15	*Underwater Inspection Condition*	

SUBSECTION 7.2: ELEMENT IDENTIFICATION

The data items in this subsection provide information about the elements inventoried for the bridge, and the total quantity of each element. These data items are considered part of the Elements Data Set and have a many-to-one relationship with a bridge when applicable.

Element data are only required to be reported to FHWA for bridges that carry NHS routes, while reporting is optional for bridges that do not carry NHS routes. Refer to B.F.01 *(Feature Type)*, B.F.02 *(Feature Location)*, and B.H.03 *(NHS Designation)* for data indicating NHS routes carried on bridges.

Data items for this subsection are reported for each element present on a bridge and the data for these items may change after each inspection.

The following data items are included in this subsection.

Item ID	Data Item
B.E.01	Element Number
B.E.02	Element Parent Number
B.E.03	Element Total Quantity

Refer to the AASHTO Manual for Bridge Element Inspection (AASHTO MBEI) for element descriptions and quantity calculations.

Refer to *Table 22* or *Figure 183* for a listing of elements for which data are reported to FHWA.

Ensure correlation between elements reported in this subsection and codes reported for items in the Bridge Material and Type section.

Elements that are entirely below ground and not accessible for inspection, such as piles and pile caps/footings, are not intended to be reported until they become exposed and visible for inspection. However, element data can be reported for elements that are not visible for inspection, or may become visible for inspection and are subsequently covered, by reporting the best available data for those elements.

Table 22. Bridge elements reported to FHWA.

Element	Units	Element Number					
		Steel	PSC	RC	Timber	Masonry	Other
Deck/Slab							
Deck	ft^2		13	12	31		60
Open Grid Deck	ft^2	28					
Concrete Filled Grid Deck	ft^2	29					
Corrugated or Orthotropic Deck	ft^2	30					
Slab	ft^2			38	54		65
Top Flange	ft^2		15	16			
Superstructure							
Closed Web/Box Girder	ft	102	104	105			106
Girder/Beam	ft	107	109	110	111		112
Stringer	ft	113	115	116	117		118
Truss	ft	120			135		136
Arch	ft	141	143	144	146	145	142
Main Cable	ft	147					
Secondary Cable	each	148					149
Floor Beam	ft	152	154	155	156		157
Pin, Pin and Hanger Assembly	each	161					
Gusset Plate	each	162					
Substructure							
Column	each	202	204	205	206		203
Column Tower (Trestle)	ft	207			208		
Pier Wall	ft			210	212	213	211
Abutment	ft	219		215	216	217	218
Pile Cap/Footing	ft			220			
Pile	each	225	226	227	228		229
Pier Cap	ft	231	233	234	235		236
Culvert							
Culvert	ft	240	245	241	242	244	243
Bridge Rail							
Bridge Rail	ft	330*		331	332	334	333
Joint							
Strip Seal	ft	300					
Pourable	ft	301					
Compression	ft	302					
Assembly with Seal (Modular)	ft	303					
Open	ft	304					
Assembly without Seal	ft	305					
Other	ft	306					
Bearing							
Elastomeric	each	310					
Movable (roller, sliding, etc.)	each	311					
Enclosed/Concealed	each	312					
Fixed	each	313					
Pot	each	314					
Disk	each	315					
Other	each	316					
Wearing Surface and Protective Coatings							
Wearing Surface	ft^2	510					
Steel Protective Coating	ft^2	515					
Concrete Protective Coating	ft^2	521					

*Element 330-Metal Bridge Rail may include steel or aluminum rails.

Element Number

Format	Frequency	Item ID
N (4,0)	EI	B.E.01

Specification	Commentary
Report the applicable element number (EN) for each element reported for the bridge.	Refer to *Table 22* for element numbers reported to FHWA.

Example

Values shown in the shaded cells, with italicized text, under column B.E.01 are the data for the elements in this example.

Element	B.E.01 EN
RC Deck	*12*
Wearing Surface	*510*
Open Joint	*304*
RC Bridge Railing	*331*
Steel Beam/Girder	*107*
Steel Protective Coating	*515*
Elastomeric Bearings	*310*
RC Columns	*205*
RC Pier Wall	*210*
RC Abutment	*215*
RC Pier Cap	*234*

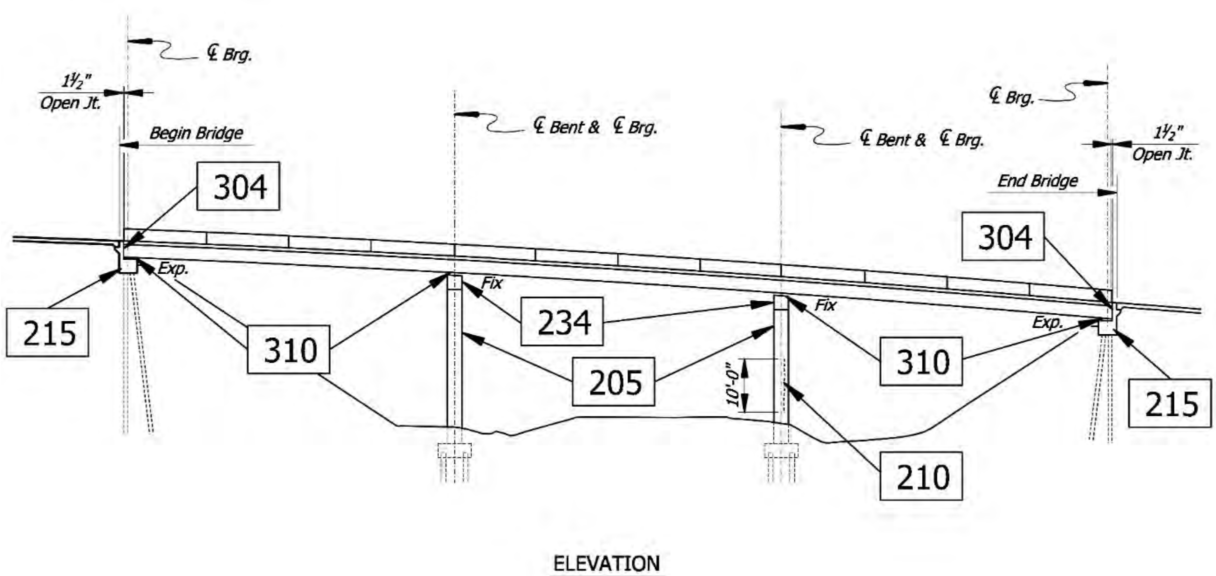


Figure 179. Bridge elevation view from construction plans for a three-span steel beam bridge. (Source: Alabama DOT)

Example Continued – Element Number

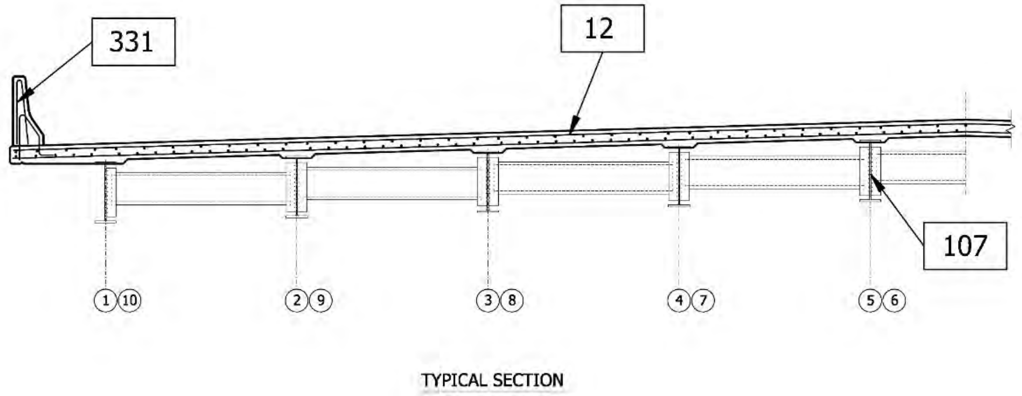


Figure 180. Typical bridge superstructure cross-section view from construction plans for a steel multi-beam bridge. (Source: Alabama DOT)

Element Parent Number

Format	Frequency	Item ID
N (4,0)	EI	B.E.02

Specification	Commentary
Report the element number of the protected element for each protective system element reported for the bridge. Do not report this item for elements that do not have a protective system.	Refer to *Table 22* for wearing surface and protective coatings elements reported to FHWA.

Example

Values shown in the shaded cells, with italicized text, under column B.E.02 are the element parent number (EPN) data for the element numbers shown in column B.E.01 in this example.

Element	B.E.01	B.E.02
	EN	EPN
RC Deck	12	
Wearing Surface	510	*12*
Open Joint	304	
RC Bridge Railing	331	
Steel Beam/Girder	107	
Steel Protective Coating	515	*107*
Elastomeric Bearings	310	
RC Columns	205	
RC Pier Wall	210	
RC Abutment	215	
RC Pier Cap	234	

Element Total Quantity

Format	Frequency	Item ID
N (8,0)	EI	B.E.03

Specification	Commentary
Report the total element quantity (Total Qty) to the nearest whole unit of measure for each applicable element reported for the bridge.	Refer to the AASHTO MBEI for details on the calculation of total element quantities for applicable elements.

Example

Quantities shown in the shaded cells, with italicized text, under column B.E.03 are the data for the element numbers shown in column B.E.01 in this example.

Element	B.E.01 EN	B.E.02 EPN	B.E.03 Total Qty
RC Deck (ft^2)	12		*16217*
Wearing Surface (ft^2)	510	12	*15783*
Open Joint (ft)	304		*158*
RC Bridge Railing (ft)	331		*412*
Steel Beam/Girder (ft)	107		*2054*
Steel Protective Coating (ft^2)	515	107	*15728*
Elastomeric Bearings (each)	310		*40*
RC Columns (each)	205		*8*
RC Pier Wall (ft)	210		*54*
RC Abutment (ft)	215		*182*
RC Pier Cap (ft)	234		*150*

Example Element Identification Data for Bridge Number 15558X

The following is a description of the elements and their total quantity. A table can be found at the end that summarizes the element identification data for this example.

There is a reinforced concrete deck (EN 12) supported on three continuous spans of steel beams. The deck area is 14,462 ft^2. The deck is protected with 12,550 ft^2 of penetrating sealer (EN 521, EPN 12).

There are four spans of a cast-in-place reinforced concrete voided slab (EN 38). The slab area is 15,340 ft^2. The slab is protected with 13,312 ft^2 of micro-silica modified concrete overlay (EN 510, EPN 38). The overlay is protected with 13,312 ft^2 of penetrating sealer (EN 521, EPN 510).

There are 806 ft of reinforced concrete bridge railing (EN 331).

There is one strip seal expansion joint (EN 300), near an intermediate support, that is 78 ft measured along the skew.

There are three continuous spans with 1,755 ft of W36x135 steel beams (EN 107). The beams have 15,287 ft^2 of steel protective coating (EN 515, EPN 107).

There are eight movable bearings (EN 311) at one abutment. The movable bearings have 62 ft^2 of steel protective coating (EN 515, EPN 311).

There are 27 elastomeric bearings (EN 310), nine at each of the three intermediate substructure units. Each bearing includes steel bolsters (risers). The bearings have 333 ft^2 of steel protective coating (EN 515, EPN 310).

There is one semi-integral abutment with nine elastomeric bearings. Each bearing includes steel bolsters (risers) with a steel protective coating. Since the abutment is semi-integral, the bearings have been cast in concrete and therefore concealed (EN 312).

There are nine pot bearings (EN 314) at an intermediate support. The pot bearings have 61 ft^2 of steel protective coating (EN 515, EPN 314).

There are 230 ft of reinforced concrete abutments (EN 215).

There are 122 ft of reinforced concrete pier wall (EN 210) that serves as a crash wall near the railroad tracks.

There are 21 reinforced concrete columns (EN 205).

No piles, pile caps, or footings were exposed and visible for inspection so these elements do not need to be reported.

In *Table 23*, Item B.E.02 (EPN) is not reported for elements under column B.E.01 (EN) where cells are shaded, with no text, under column B.E.02 (EPN).

Table 23. Data items in the Elements Data Set for Bridge Number 15558X.

B.E.01	B.E.02	B.E.03
EN	EPN	Total Qty
12		14462
521	12	12550
38		15340
510	38	13312
521	510	13312
107		1755
515	107	15287
205		21
210		122
215		230
234		223
300		78
310		27
515	310	333
311		8
515	311	62
312		9
314		9
515	314	61
331		806

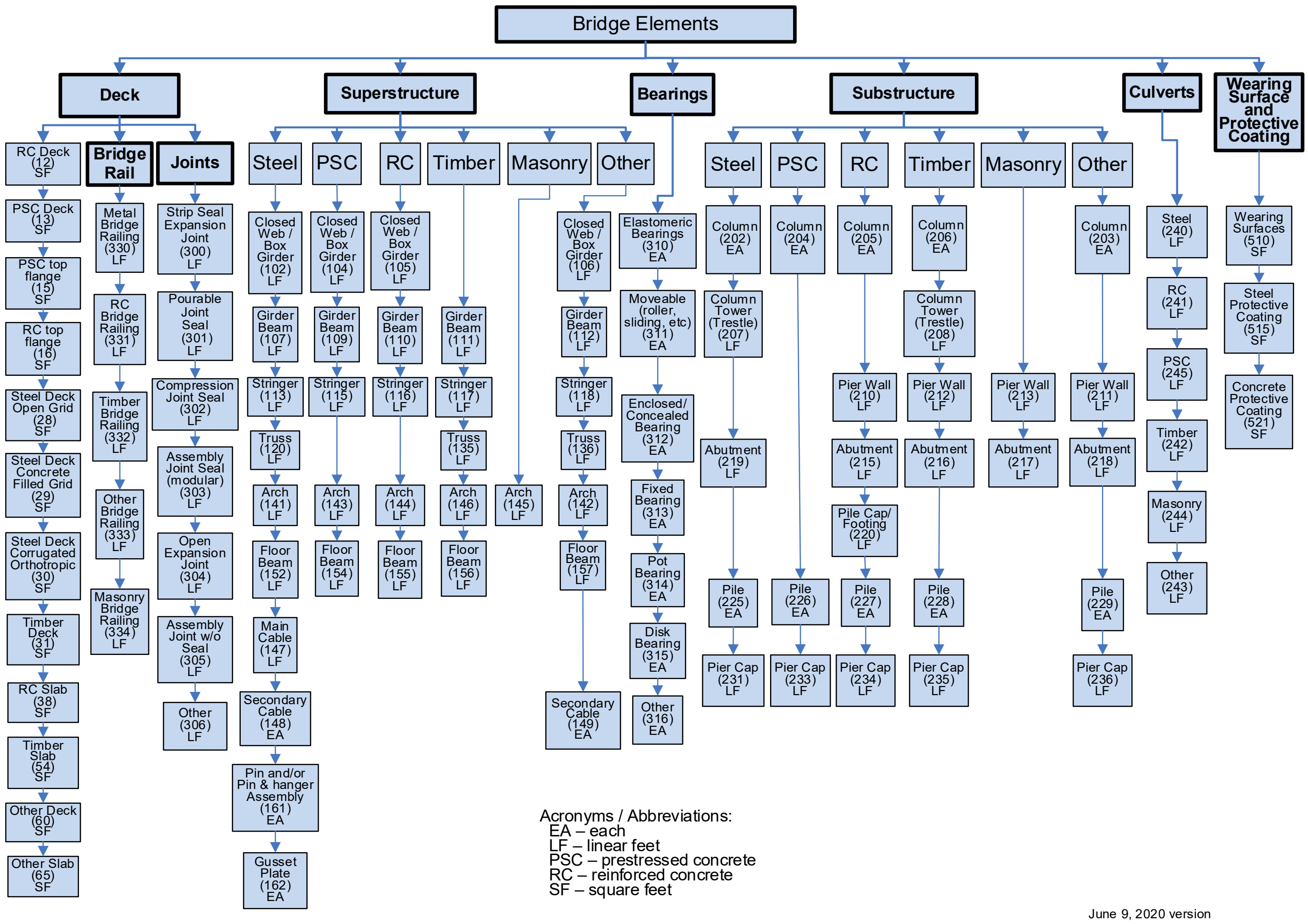


Figure 181. Bridge elements reported to FHWA.

SUBSECTION 7.3: ELEMENT CONDITIONS

The data items in this subsection provide information about the element condition quantity that exists in each of four condition states for the respective elements reported in the Element Identification subsection. These items are considered part of the Elements Data Set and have a many-to-one relationship with a bridge when applicable.

Element data are only required to be reported to FHWA for bridges that carry NHS routes, while reporting is optional for bridges that do not carry NHS routes. Refer to B.F.01 *(Feature Type)*, B.F.02 *(Feature Location)*, and B.H.03 *(NHS Designation)* for data indicating NHS routes carried on bridges.

Data items for this subsection are reported for each element present on a bridge, and the data for these items may change after each inspection.

The following data items are included in this subsection.

Item ID	**Data Item**
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

Refer to the AASHTO Manual for Bridge Element Inspection (AASHTO MBEI) for element defect and condition state definitions.

Refer to *Table 22* or *Figure 183* for listing of elements for which data are reported to FHWA. Specific material defects as shown in the AASHTO MBEI are not reported to FHWA.

All elements have four defined condition states. The severity of multiple distress paths or deficiencies is defined in the AASHTO MBEI for each condition state, with the general intent of the condition states as follows: Condition State One (CS1) – Good, Condition State Two (CS2) – Fair, Condition State Three (CS3) – Poor, and Condition State Four (CS4) – Severe.

The sum of the quantities recorded for items B.CS.01 *(Element Quantity Condition State One)*, B.CS.02 *(Element Quantity Condition State Two)*, B.CS.03 *(Element Quantity Condition State Three)*, and B.CS.04 *(Element Quantity Condition State Four)* must equal the quantity recorded in item B.E.03 *(Element Total Quantity)*.

Elements that are entirely below ground and not accessible for inspection, such as piles and pile caps/footings, are not intended to be reported until they become exposed and visible for inspection. However, element data can be reported for elements that are not visible for inspection, or may become visible for inspection and are subsequently covered, by reporting the best available data for those elements.

Element Quantity Condition State One

Format	Frequency	Item ID
N (8,0)	EI	B.CS.01

Specification	Commentary
Report the element quantity assigned to condition state one (CS1 Qty) to the nearest whole unit of measure for each element reported for the bridge.	Refer to the AASHTO MBEI for element defect and condition state definitions.

Example

Quantities shown in the shaded cells, with italicized text, under column B.CS.01 are the data for the element numbers shown under column B.E.01 in this example.

Element	B.E.01 EN	B.E.02 EPN	B.E.03 Total Qty	B.CS.01 CS1 Qty
RC Deck (ft^2)	12		16217	*0*
Wearing Surface (ft^2)	510	12	15783	*15083*
Open Joint (ft)	304		158	*100*
RC Bridge Railing (ft)	331		412	*360*
Steel Beam/Girder (ft)	107		2054	*1044*
Steel Protective Coating (ft^2)	515	107	15728	*0*
Elastomeric Bearings (each)	310		40	*30*
RC Columns (each)	205		8	*4*
RC Pier Wall (ft)	210		54	*44*
RC Abutment (ft)	215		182	*140*
RC Pier Cap (ft)	234		150	*105*

Element Quantity Condition State Two

Format	Frequency	Item ID
N (8,0)	EI	B.CS.02

Specification	Commentary
Report the element quantity assigned to condition state two (CS2 Qty) to the nearest whole unit of measure for each element reported for the bridge.	Refer to the AASHTO MBEI for element defects and condition state definitions.

Example

Quantities shown in the shaded cells, with italicized text, under column B.CS.02 are the data for the element numbers shown under column B.E.01 in this example.

Element	B.E.01 EN	B.E.02 EPN	B.E.03 Total Qty	B.CS.01 CS1 Qty	B.CS.02 CS2 Qty
RC Deck (ft^2)	12		16217	0	*16000*
Wearing Surface (ft^2)	510	12	15783	15083	*500*
Open Joint (ft)	304		158	100	*58*
RC Bridge Railing (ft)	331		412	360	*40*
Steel Beam/Girder (ft)	107		2054	1044	*1000*
Steel Protective Coating (ft^2)	515	107	15728	0	*5628*
Elastomeric Bearings (each)	310		40	30	*5*
RC Columns (each)	205		8	4	*4*
RC Pier Wall (ft)	210		54	44	*5*
RC Abutment (ft)	215		182	140	*30*
RC Pier Cap (ft)	234		150	105	*30*

Element Quantity Condition State Three

Format	Frequency	Item ID
N (8,0)	EI	B.CS.03

Specification	Commentary
Report the element quantity assigned to condition state three (CS3 Qty) to the nearest whole unit of measure for each element reported for the bridge.	Refer to the AASHTO MBEI for element defects and condition state definitions.

Example

Quantities shown in the shaded cells, with italicized text, under column B.CS.03 are the data for the element numbers shown under column B.E.01 in this example.

Element	B.E.01	B.E.02	B.E.03	B.CS.01	B.CS.02	B.CS.03
	EN	EPN	Total Qty	CS1 Qty	CS2 Qty	CS3 Qty
RC Deck (ft^2)	12		16217	0	16000	*217*
Wearing Surface (ft^2)	510	12	15783	15083	500	*0*
Open Joint (ft)	304		158	100	58	*0*
RC Bridge Railing (ft)	331		412	360	40	*12*
Steel Beam/Girder (ft)	107		2054	1044	1000	*10*
Steel Protective Coating (ft^2)	515	107	15728	0	5628	*10000*
Elastomeric Bearings (each)	310		40	30	5	*5*
RC Columns (each)	205		8	4	4	*0*
RC Pier Wall (ft)	210		54	44	5	*5*
RC Abutment (ft)	215		182	140	30	*12*
RC Pier Cap (ft)	234		150	105	30	*15*

Element Quantity Condition State Four

Format	Frequency	Item ID
N (8,0)	EI	B.CS.04

Specification	Commentary
Report the element quantity assigned to condition state four (CS4 Qty) to the nearest whole unit of measure for each element reported for the bridge.	Refer to the AASHTO MBEI for element defects and condition state definitions.

Example

Quantities shown in the shaded cells, with italicized text, under column B.CS.04 are the data for the element numbers shown under column B.E.01 in this example.

Element	B.E.01	B.E.02	B.E.03	B.CS.01	B.CS.02	B.CS.03	B.CS.04
	EN	EPN	Total Qty	CS1 Qty	CS2 Qty	CS3 Qty	CS4 Qty
RC Deck (ft^2)	12		16217	0	16000	217	*0*
Wearing Surface (ft^2)	510	12	15783	15083	500	0	*200*
Open Joint (ft)	304		158	100	58	0	*0*
RC Bridge Railing (ft)	331		412	360	40	12	*0*
Steel Beam/Girder (ft)	107		2054	1044	1000	10	*0*
Steel Protective Coating (ft^2)	515	107	15728	0	5628	10000	*100*
Elastomeric Bearings (each)	310		40	30	5	5	*0*
RC Columns (each)	205		8	4	4	0	*0*
RC Pier Wall (ft)	210		54	44	5	5	*0*
RC Abutment (ft)	215		182	140	30	12	*0*
RC Pier Cap (ft)	234		150	105	30	15	*0*

Example Element Data Set

This example shows the progression of element data sets considering all inspections performed since the last reporting of data to FHWA and ending with the data set *(Table 26)* that would be reported to FHWA.

Table 24. Element data set for a complete routine inspection performed since the last reporting of data to FHWA.

B.E.01	B.E.02	B.E.03	B.CS.01	B.CS.02	B.CS.03	B.CS.04
EN	EPN	Total Qty	CS1 Qty	CS2 Qty	CS3 Qty	CS4 Qty
12		16217	0	16000	217	0
510	12	15783	15083	500	0	200
107		2054	1044	1000	10	0
515	107	15728	0	5628	10000	100
205		8	4	4	0	0
210		54	44	5	5	0
215		182	140	30	12	0
234		150	105	30	15	0
304		158	100	58	0	0
310		40	30	5	5	0
331		412	360	40	12	0

Preservation work was completed on the reinforced concrete deck (EN 12) and steel open girder/beam (EN 107). An inspection was performed prior to reporting data to FHWA to update the condition of the following elements: steel protective coating (EN 515), steel open girder/beam (EN 107 - with section loss), reinforced concrete deck (EN 12), new wearing surface (EN 510), and new pourable joints (EN 301). The element data for this inspection is shown in *Table 25*.

Table 25. Element data collected for a one-time special inspection performed to account for preservation work that occurred after the inspection data shown in *Table 24* and prior to reporting data to FHWA.

B.E.01	B.E.02	B.E.03	B.CS.01	B.CS.02	B.CS.03	B.CS.04
EN	EPN	Total Qty	CS1 Qty	CS2 Qty	CS3 Qty	CS4 Qty
12		16217	0	*16217*	*0*	0
510	12	15783	*15783*	*0*	0	*0*
107		2054	*2044*	*0*	10	0
515	107	15728	*15728*	*0*	*0*	*0*
301		158	*158*	*0*	0	0

Cells shaded, with italicized text, in columns B.E.01, B.CS.01, B.CS.02, B.CS.03, and B.CS.04 show changes in data from *Table 24*.

Table 26. Element data set reported to FHWA reflecting all inspections performed since the last reporting of data to FHWA.

B.E.01	B.E.02	B.E.03	B.CS.01	B.CS.02	B.CS.03	B.CS.04
EN	EPN	Total Qty	CS1 Qty	CS2 Qty	CS3 Qty	CS4 Qty
12		16217	0	*16217*	*0*	0
510	12	15783	*15783*	*0*	0	*0*
107		2054	*2044*	*0*	10	0
515	107	15728	*15728*	*0*	*0*	*0*
301		158	*158*	*0*	0	0
205		8	4	4	0	0
210		54	44	5	5	0
215		182	140	30	12	0
234		150	105	30	15	0
310		40	30	5	5	0
331		412	360	40	12	0

Cells shaded, with italicized text, in columns B.E.01, B.CS.01, B.CS.02, B.CS.03, and B.CS.04 show changes in data from *Table 24*.

Example Element Conditions Data for Bridge Number 15558X

The following is a description of the elements, their total quantity, and condition state quantities. A table can be found at the end that summarizes the element data for this example.

There is a reinforced concrete deck (EN 12) supported on three continuous spans of steel beams. The deck area is 14,462 ft^2 of which 7,431 ft^2 was determined to be in good condition (CS1) and 7,031 in fair condition (CS2). The deck is protected with 12,550 ft^2 of penetrating sealer (EN 521, EPN 12) of which 5,519 ft^2 was determined to be in fair condition (CS2) and 7,031 ft^2 in poor condition (CS3).

There are four spans of a cast-in-place reinforced concrete voided slab (EN 38). The slab area is 15,340 ft^2 of which 11,474 ft^2 was determined to be in good condition (CS1) and 3,866 ft^2 in fair condition (CS2). The slab is protected with 13,312 ft^2 of micro-silica modified concrete overlay (EN 510, EPN 38) of which 6,812 ft^2 was determined to be in good condition (CS1) and 6,500 ft^2 in fair condition (CS2). The overlay is protected with 13,312 ft^2 of penetrating sealer (EN 521, EPN 510) of which 6,812 ft^2 was determined to be in fair condition (CS2) and 6,500 ft^2 in poor condition (CS3).

There are 806 ft of reinforced concrete bridge railing (EN 331) on the bridge of which 427 ft was determined to be in good condition (CS1) and 379 ft in fair condition (CS2).

There is one strip seal expansion joint (EN 300), near an intermediate support, that is 78 ft measured along the skew. The joint was determined to have 78 ft in poor condition (CS3).

There are three continuous spans with 1,755 ft of W36x135 steel beams (EN 107) of which 1,648 ft was determined to be in good condition (CS1) and 107 ft in fair condition (CS2). The beams have 15,287 ft^2 of steel protective coating (EN 515, EPN 107) of which 10,609 ft^2 was determined to be in good condition (CS1), 4,628 ft^2 in fair condition (CS2), and 50 ft^2 in severe condition (CS4).

There are eight movable bearings (EN 311) at one abutment of which eight have been determined to be in fair condition (CS2). The movable bearings have 62 ft^2 of steel protective coating (EN 515, EPN 311) of which 32 ft^2 has been determined to be in fair condition (CS2) and 30 ft^2 in severe condition (CS4).

There are 27 elastomeric bearings (EN 310), nine at each of the three intermediate substructure units, of which 14 were determined to be in good condition (CS1) and 13 in fair condition (CS2). Each bearing includes steel bolsters (risers). The bearings have 333 ft^2 of steel protective coating (EN 515, EPN 310) of which 233 ft^2 was determined to be in fair condition (CS2) and 100 ft^2 in severe condition (CS4).

There is one semi-integral abutment with nine elastomeric bearings. Each bearing includes steel bolsters (risers) with a steel protective coating. Since the abutment is semi-integral, the bearings have been cast in concrete and therefore concealed (EN 312). The bearings were determined to be in good condition (CS1).

There are nine pot bearings (EN 314) at an intermediate support of which nine were determined to be in fair condition (CS2). The pot bearings have 61 ft^2 of steel protective coating (EN 515, EPN 314) of which 31 ft^2 was determined to be in fair condition (CS2) and 30 ft^2 in severe condition (CS4).

There are 230 ft of reinforced concrete abutments (EN 215) of which 117 ft was determined to be in good condition (CS1) and 113 ft in fair condition (CS2).

There are 122 ft of reinforced concrete pier wall (EN 210) that serves as a crash wall near the railroad tracks of which 122 ft was determined to be in good condition (CS1).

There are 21 reinforced concrete columns (EN 205) of which 14 were determined to be in good condition (CS1) and seven in fair condition (CS2).

No piles, pile caps, or footings were exposed and visible for inspection so these elements do not need to be reported.

In *Table 27*, Item B.E.02 (EPN) is not reported for elements under column B.E.01 (EN) where cells are shaded, with no text, under column B.E.02 (EPN).

Table 27. Data items in the Elements Data Set for Bridge Number 15558X.

B.E.01	B.E.02	B.E.03	B.CS.01	B.CS.02	B.CS.03	B.CS.04
EN	EPN	Total Qty	CS1 Qty	CS2 Qty	CS3 Qty	CS4 Qty
12		14462	7431	7031	0	0
521	12	12550	0	5519	7031	0
38		15340	11474	3866	19	0
510	38	13312	6812	6500	0	0
521	510	13312	0	6812	6500	0
107		1755	1648	107	0	0
515	107	15287	10609	4628	0	50
205		21	14	7	0	0
210		122	122	0	0	0
215		230	117	113	0	0
234		223	223	0	0	0
300		78	0	0	78	0
310		27	14	13	0	0
515	310	333	0	233	0	100
311		8	0	8	0	0
515	311	62	0	32	0	30
312		9	9	0	0	0
314		9	0	9	0	0
515	314	61	0	31	0	30
331		806	427	379	0	0

SUBSECTION 7.4: APPRAISAL

The data items in this subsection provide information about potential bridge vulnerabilities. These data items are considered part of the Primary Data Set and have a one-to-one relationship with a bridge. The data for these items typically remain static once a bridge has been initially inventoried and inspected, or verified during subsequent inspections.

The following data items are included in this subsection.

Item ID	Data Item
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

Approach Roadway Alignment

Format	Frequency	Item ID
AN (1)	EI	B.AP.01

Specification	Commentary
Report the operating speed reduction at the bridge using one of the following codes. Code / Description G Good F Fair P Poor	This item identifies bridges that do not function adequately due to the horizontal or vertical alignment of the bridge and approach roadway. It is not intended that the alignment be compared to current standards, but rather to the existing roadway alignment. The basic criterion is how the alignment of the bridge and approach roadway relates to the general highway alignment for the section of highway the bridge carries.

Commentary Continued

Do not consider speed reductions due to the bridge width or intersecting highways when reporting this item.

The operating speed reduction is in comparison to the posted speed limit for the highway segment.

Use code G when the operating speed is no different at the bridge than the rest of the highway segment that crosses the bridge.

Use code F when the operating speed is noticeably different at the bridge than the rest of the highway segment that crosses the bridge.

Use code P when the operating speed is substantially different at the bridge than the rest of the highway segment that crosses the bridge.

Overtopping Likelihood

Format	Frequency	Item ID
AN (1)	EI	B.AP.02

Specification	Commentary
Report the likelihood of the waterway overtopping the bridge using one of the following codes. Code / Description 0 Never 1 Remote – once every 100 years or less frequently 2 Very low – once every 51 to 99 years 3 Low – once every 26 to 50 years 4 Moderate – once every 11 to 25 years 5 High – once every 3 to 10 years 6 Very High – once every 2 years or more frequently Do not report this item if the bridge does not cross over a waterway as indicated in Item B.F.01 *(Feature Type)*.	An overtopping occurrence is when the waterway overtops the riding surface carried on the bridge. Bridge overtopping likelihood, since the year built (B.W.01), is typically determined from historical bridge inspection or maintenance records, hydraulic studies, local residents/landowners, and/or site indicators including highwater marks on the bridge or its surroundings, debris remains on bridge upper members, etc. For newer bridges with limited historical inspection or maintenance information, hydraulic design information can be used to establish an overtopping likelihood. This item does not apply to the likelihood of the waterway overtopping approach roadways.

Scour Vulnerability

Format	Frequency	Item ID
AN (1)	I	B.AP.03

Specification	Commentary
Report the scour vulnerability of the bridge using one of the following codes. Code — Description 0 — Scour appraisal has not been completed. A — Scour appraisal completed. Bridge determined to be stable for scour. B — Scour appraisal completed. Bridge determined to be stable for scour, dependent upon designed, and functioning countermeasures. C — Scour appraisal completed. Bridge could become unstable for scour. Temporary (not designed) countermeasure installed to mitigate scour. Bridge is scour critical. D — Scour appraisal completed. Bridge is, or may become, unstable for scour. Bridge is scour critical. E — Scour appraisal has not been completed. Temporary (not designed) countermeasure installed to mitigate scour. U — Scour appraisal has not been completed due to unknown foundations. Do not report this item if the bridge does not cross over a waterway as indicated in Item B.F.01 *(Feature Type)*.	The intent of this item is to report the status and vulnerability determination from scour appraisals required by the NBIS. The codes for this item are based on the appraised scour vulnerability as described in HEC-18, Evaluating Scour at Bridges; HEC-23, Bridge Scour and Stream Instability Countermeasures; and HEC-20, Stream Stability at Highway Structures. Scour appraisals are typically performed by a multidisciplinary team of hydraulic, geotechnical, and structural engineers (Scour Appraisal Team). FHWA Hydraulic Technical Advisories, manuals, and software can be found at: *http://www.fhwa.dot.gov/engineering/hydraulics/index.cfm.* Refer to item B.C.11 *(Scour Condition Rating)* in the Component Condition Ratings subsection to address field observed scour conditions and the effect on bridge components. Use code B when designed, installed, and functioning countermeasures are used to address potential scour and to maintain bridge stability for new or existing bridges, or bridges with unknown foundations. Use code B when the Scour Appraisal Team determines that the in-place, non-designed countermeasures are fully functioning and are appropriate to mitigate the risk of scour. Use code C for bridges that could become unstable for the potential scour, and temporary countermeasures are installed that were not designed.

Scour Plan of Action

Format	Frequency	Item ID
AN (1)	I	B.AP.04

Specification	Commentary
Report whether the bridge has a scour plan of action (POA) implemented using one of the following codes. Code / Description 0 — A scour POA is not required. 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)*.	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.* Use code 0 if a bridge was considered scour critical, but now has designed, installed, and fully functional scour countermeasures. 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. 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.

Seismic Vulnerability

Format	Frequency	Item ID
AN (1)	I	B.AP.05

Specification	Commentary
Report the seismic vulnerability of the bridge using one of the following codes. Code — Description 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. 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. D — Seismic evaluation completed. Satisfactory performance is dependent upon a designed, installed, and functioning retrofit. Retrofit is not in place.	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. Use code A 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. Use code C 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.

Example Appraisal Data for Bridge Number 15558X

The operating speed of vehicles is noticeably different at the bridge than the rest of the highway segment that crosses the bridge. Report F for Item B.AP.01 *(Approach Roadway Alignment)*.

Figure 182. Approach roadway for Bridge Number 15558X, looking south.

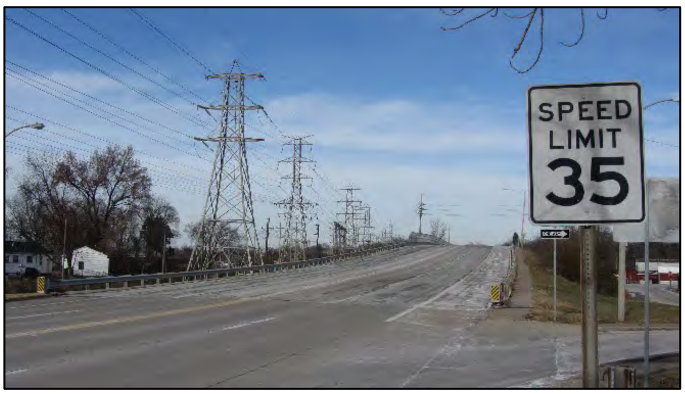


Figure 183. Approach roadway with speed limit sign for Bridge Number 15558X, looking north.

The bridge deck is well above expected and historical flood elevations and is anticipated to never be overtopped. Report 0 for Item B.AP.02 *(Overtopping Likelihood)*.

A scour appraisal has been completed for the bridge and the bridge has been determined to be stable for scour. Therefore, the bridge does not require a scour plan of action. Report A for Item B.AP.03 *(Scour Vulnerability)*. Report 0 for Item B.AP.04 *(Scour Plan of Action)*.

The bridge is in a seismically vulnerable area and had a seismic evaluation completed using agency criteria. The bridge has been retrofitted with designed, installed, and functioning earthquake restrainer assemblies. Report B for Item B.AP.05 *(Seismic Vulnerability)*.

Table 28. Appraisal data items in the Primary Data Set for Bridge Number 15558X.

Item ID	Data Item	Value
B.AP.01	*Approach Roadway Alignment*	F
B.AP.02	*Overtopping Likelihood*	0
B.AP.03	*Scour Vulnerability*	A
B.AP.04	*Scour Plan of Action*	0
B.AP.05	*Seismic Vulnerability*	B

SUBSECTION 7.5: WORK EVENTS

The data items in this subsection provide information about the year the bridge was built, and subsequent work performed on the bridge. These items provide information to assist in identifying the age of the bridge, substantiate condition rating changes, and assess service life.

Item B.W.01 *(Year Built)* is considered part of the Primary Data Set and has a one-to-one relationship with a bridge. The data for this item typically remain static once a bridge has been inventoried.

Items B.W.02 *(Year Work Performed)* and B.W.03 *(Work Performed)* are considered part of the Work Data Set and have a many-to-one relationship with a bridge. These items are reported for each year regardless of whether work was completed in that year. Reporting work events that were accepted into the NBI in prior years is not required unless it is found that the accepted data were incomplete or incorrect. To correct previously submitted work data for a given year, report a new complete work data set representative of that year.

The following data items are included in this subsection.

Item ID	Data Item
B.W.01	Year Built
B.W.02	Year Work Performed
B.W.03	Work Performed

Year Built

Format	Frequency	Item ID
N (4,0)	I	B.W.01

Specification	Commentary
Report the year in which original construction was completed and the bridge was able to carry traffic. For phased construction, report the year in which the first phase was completed and the bridge was able to carry traffic.	This date reflects the date when construction was completed, regardless of when the bridge was opened to traffic. Rehabilitation and/or widening of a bridge does not change the year built. If any portion of the bridge remains, the year built does not change. Provide a best estimate when the year built is unknown; do not assign a default value.

Year Work Performed

Format	Frequency	Item ID
N (4,0)	I	B.W.02

Specification	Commentary
Report the year that work was completed on a bridge. For phased construction, report the year in which the first phase was completed and the bridge was able to carry traffic. This item is reported for each year regardless of whether work was completed on a bridge in that year.	This item identifies when work was completed to improve the functionality of a bridge, prevent deterioration from occurring, preserve a bridge, or restore the strength or performance of a bridge. Work performed should be identifiable by inspectors conducting an initial inspection following bridge replacement or rehabilitation. For other work types, information can be obtained from work tracking systems. When tracking systems are not readily accessible, estimate based on knowledge, observed changes and condition improvements since the previous inspection, applied stencils or stamps, wear, etc.

Examples

A lane was added in 2016 during a corridor widening project. Report 2016.

The deck, superstructure, railing, deck joints, and bearings were replaced on existing abutments in 2017. Report 2017.

All bearings and two of three deck joints were replaced in 2015. Report 2015.

Major rehabilitation was performed on a deck in multiple stages. The first stage was completed and opened to traffic in 2018. The final stage was completed in 2020. Report 2018.

Work Performed

Format	Frequency	Item ID
AN (120)	I	B.W.03

Specification

Report all work completed on the bridge in each year, using one or more of the codes shown in the work category tables below.

Report multiple codes separated by pipe (|) delimiters.

Report all types of work when improvement, rehabilitation, or preservation work categories were performed in combination (one or more work types from Table 30, 31, 32, and/or 33).

Do not report bridge improvement or bridge preservation (Table 30, 32, or 33) when the work resulted from replacement of a bridge (including replacement of all culvert barrels), or replacement of the deck, superstructure, or substructure, (Table 29 or Table 31 replacement work types).

Report only major rehabilitation when both major and minor rehabilitation were completed on the same component (e.g. the deck, superstructure, substructure, or culvert).

Do not report routine maintenance or routine repair.

Report 0 when no work is completed or when work is completed that does not correspond with the work included in the following work category tables.

Table 29. Bridge replacement code.

Code	Description
BR1	Replaced

Table 30. Bridge improvement codes.

Code	Description
IP1	Widened
IP2	Raised
IP3	Strengthened by retrofit
IP4	Seismic retrofit

Table 31. Rehabilitation codes for deck, superstructure, substructure, and culvert.

Code				Description
Deck	Superstructure	Substructure	Culvert	
DK1	SP1	SB1		Replaced
DK2	SP2	SB2	CU2	Major Rehabilitation
DK3	SP3	SB3	CU3	Minor Rehabilitation

Specification Continued – Work Performed

Table 32. Preservation codes for deck, superstructure, substructure, and culvert.

Code				Description
Deck	Superstructure	Substructure	Culvert	
DK4			CU4	Overlaid
DK5	SP5	SB5	CU5	Sealed
	SP6	SB6	CU6	Coating (New or Replaced)
	SP7	SB7	CU7	Coating (Preserved)

Table 33. Other preservation codes.

Code						Description
Bearings	Deck Joints	Bridge Railings or Transitions	Scour Counter-measures	Channel Protection	Channel	
BG1	JT1	RT1	SC1	CP1		Installed or Replaced
BG2	JT2	RT2	SC2	CP2		Repaired
					CH1	Condition Improved

Commentary – Work Performed

This item is used to indicate work that was completed to improve the functionality of a bridge, prevent deterioration from occurring, preserve a bridge, or restore the strength or performance of a bridge.

Use deck, superstructure, and substructure work codes as applicable, and only when work is performed on span configurations that are not reported as culverts in Item B.SP.01 *(Span Configuration Designation)*; i.e. M, A, or W is reported. Use culvert work codes as applicable, and only when work is performed on span configurations that are reported as culverts in Item B.SP.01 *(Span Configuration Designation)*; i.e. C or V is reported.

Routine maintenance or routine repair work to be excluded from reporting include actions that may be performed on isolated deficiencies, may be reactive in nature, and do not add measurable service life given the small work quantity. Instead, they are intended to maintain a minimum acceptable performance level. Generally, routine maintenance or routine repair does not improve component condition ratings. Examples of routine maintenance or routine repairs that are not reported are: deck patching to correct isolated spalls or punctures that are affecting rideability or safety, sidewalk repairs to correct isolated defects that affect public safety, and repair of isolated impact damage to railings or transitions.

Work performed should be identifiable by inspectors conducting an initial inspection following bridge replacement or rehabilitation. For other work types, information can be obtained from work tracking systems. When tracking systems are not readily accessible, estimate based on knowledge, observed changes and condition improvements since the previous inspection, applied stencils or stamps, wear, etc.

Use code BR1 *(Table 29)* when the bridge is replaced and the same bridge number is retained. This item is generally not reported when a bridge is replaced, because it is preferable that a new bridge number is assigned.

Commentary Continued – Work Performed
Use code BR1 when all barrels of a culvert were replaced. Use codes IP1, IP2, IP3, and IP4 *(Table 30)* for functional and seismic improvements. Use code IP3 when the bridge was retrofitted to increase its load capacity beyond the original design capacity. Use codes DK1, SP1, and SB1 *(Table 31)* for replacement of the deck, superstructure, and substructure, respectively. Use these codes only when the whole component on the bridge is replaced. Use codes DK2, SP2, SB2, and CU2 *(Table 31)* for major rehabilitation work. Major rehabilitation is defined as the major work required to restore the structural integrity or serviceability of a bridge as well as the work to correct major safety defects. These codes also apply when one or more spans, barrels, or units were replaced, but not all. Use codes DK3, SP3, SB3, and CU3 *(Table 31)* for minor rehabilitation work, not to include minor repairs. Minor rehabilitation is defined as minor work required to preserve or restore the structural integrity or serviceability of a bridge, as well as the work to correct minor safety defects. For this specification, it generally should include work that affects no more than 25 percent of the deck area within any span, or 25 percent of any one substructure unit or culvert barrel. Use codes CU2 or CU3, as applicable, when culvert invert paving or encasement restores strength or performance, although it may also prevent deterioration. Use deck, superstructure, substructure, and culvert preservation codes *(Table 32)* for preventive maintenance and preservation work that may also include some minor repairs. Use code DK4 *(Table 32)* for overlay work. Also use codes DK2 or DK3 *(Table 31)*, if applicable based on quantity, when work includes exposing the top mat of deck reinforcing steel. Use codes SP7, SB7, and CU7 *(Table 32)* when zone coating, spot coating, or overcoating was applied to repair and extend the life of existing coatings. Use codes CU6 or CU7, as applicable, for culvert pipe invert paving or encasement intended only to prevent deterioration. Use codes CP1 or CP2 *(Table 33)* when channel protection work was completed at or adjacent to the bridge to mitigate channel issues that may impact the bridge. Use code CH1 *(Table 33)* when the channel was improved by means other than protection systems or in addition to protection systems (e.g. horizontal realignment, excavation of aggregated material, or removal of large debris deposits). Use this code when work was completed at or adjacent to the bridge to mitigate channel issues that may impact the bridge.

Examples – Work Performed
A lane was added during a corridor widening project. Report IP1.
A low-build surface sealer was placed on the deck, and deck joints were repaired. Report DK5|JT2.
The deck, superstructure, railing, deck joints, and bearings were replaced on existing abutments. Report DK1|SP1 since the railing, deck joints, and bearing replacement resulted from the deck and superstructure replacement.
The deck concrete was removed to just below the top mat of reinforcing steel over 35 percent of the deck area, the deck was patched and overlaid with a thin epoxy, and the superstructure coating was removed and replaced. Report DK2|DK4|SP6.
Girder end reinforcement plates were added to restore strength at 20% of the girder ends in one of three spans. Report SP3.
All bearings and two of three deck joints were replaced. Report BG1|JT1.
All bearings were replaced, two of three deck joints were replaced, and one deck joint was repaired. Report BG1|JT1|JT2.
The far masonry abutment had work performed to correct a local scour hole and the settled and displaced bottom course of masonry stone. The masonry was repositioned and underpinned and a designed riprap scour countermeasure was installed around the abutment. Report SB3|SC1.
One of six HDPE pipes was replaced, and the remaining pipes had all transverse joints repaired with inner concrete collars. Report CU2 since this work includes both major and minor rehabilitation on the same component.
Girders had minor rehabilitation to restore multiple locations with section loss, the coating was replaced, and bolted cover plates were added to increase strength beyond the original design capacity. Report SP3|SP6|IP3.

Example Work Events Data for Bridge Number 15558X

Original bridge construction was completed in 1974. The superstructure coating was replaced and the deck was replaced and opened to traffic in the fall of 2015. A thin epoxy overlay was applied to the recently replaced deck during the following spring of 2016. No work was completed in 2017.

Table 34. Work Events data items in the Primary Data Set for Bridge Number 15558X.

Item ID	Data Item	Value
B.W.01	*Year Built*	1974

Table 35. Work Events data items in the Work Data Set for Bridge Number 15558X.

Item ID	Data Item	Value (1)	Value (2)	Value (3)
B.W.02	*Year Work Performed*	2015	2016	2017
B.W.03	*Work Performed*	SP6|DK1	DK4	0

APPENDIX A: COMPREHENSIVE EXAMPLE DATA SETS & DATA ITEMS FOR BRIDGE NUMBER 15558X

Shaded cells in the following tables indicate when data items are not reported or left blank according to the data item specifications.

Table 36. Primary Data Set for Bridge Number 15558X.

Item ID	Data Item	Value
B.ID.01	*Bridge Number*	15558X
B.ID.02	*Bridge Name*	North Hanley Road Bridge
B.ID.03	*Previous Bridge Number*	0
B.L.01	*State Code*	29
B.L.02	*County Code*	189
B.L.03	*Place Code*	4906
B.L.04	*Highway Agency District*	5
B.L.05	*Latitude*	38.755356
B.L.06	*Longitude*	-90.334486
B.L.07	*Border Bridge Number*	N
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*	0.4 miles north on N Hanley Rd from intersection with Airport Rd
B.L.12	*Metropolitan Planning Organization*	East-West Gateway Council of Governments
B.CL.01	*Owner*	L01
B.CL.02	*Maintenance Responsibility*	L01
B.CL.03	*Federal or Tribal Land Access*	N
B.CL.04	*Historic Significance*	N
B.CL.05	*Toll*	N
B.CL.06	*Emergency Evacuation Designation*	N
B.RH.01	*Bridge Railings*	3504
B.RH.02	*Transitions*	S92
B.G.01	*NBIS Bridge Length*	400.6
B.G.02	*Total Bridge Length*	407.6
B.G.03	*Maximum Span Length*	75.0
B.G.04	*Minimum Span Length*	45.0
B.G.05	*Bridge Width Out-to-Out*	73.8
B.G.06	*Bridge Width Curb-to-Curb*	64.0
B.G.07	*Left Curb or Sidewalk Width*	3.5
B.G.08	*Right Curb or Sidewalk Width*	3.5
B.G.09	*Approach Roadway Width*	66.7
B.G.10	*Bridge Median*	0

Item ID	Data Item	Value
B.G.11	*Skew*	45
B.G.12	*Curved Bridge*	N
B.G.13	*Maximum Bridge Height*	38
B.G.14	*Sidehill Bridge*	N
B.G.15	*Irregular Deck Area*	
B.G.16	*Calculated Deck Area (Determined by FHWA*)*	30080.9*
B.LR.01	*Design Load*	HS20
B.LR.02	*Design Method*	ASD
B.LR.03	*Load Rating Date*	20160214
B.LR.04	*Load Rating Method*	LFR
B.LR.05	*Inventory Load Rating Factor*	0.30
B.LR.06	*Operating Load Rating Factor*	0.50
B.LR.07	*Controlling Legal Load Rating Factor*	0.44
B.LR.08	*Routine Permit Loads*	C
B.IR.01	*NSTM Inspection Required*	N
B.IR.02	*Fatigue Details*	N
B.IR.03	*Underwater Inspection Required*	N
B.IR.04	*Complex Feature*	N
B.C.01	*Deck Condition Rating*	6
B.C.02	*Superstructure Condition Rating*	5
B.C.03	*Substructure Condition Rating*	6
B.C.04	*Culvert Condition Rating*	N
B.C.05	*Bridge Railings Condition Rating*	7
B.C.06	*Bridge Railing Transitions Condition Rating*	7
B.C.07	*Bridge Bearings Condition Rating*	4
B.C.08	*Bridge Joints Condition Rating*	2
B.C.09	*Channel Condition Rating*	5
B.C.10	*Channel Protection Condition Rating*	6
B.C.11	*Scour Condition Rating*	9
B.C.12	*Bridge Condition Classification (Determined by FHWA*)*	F*
B.C.13	*Lowest Condition Rating Code (Determined by FHWA*)*	5*
B.C.14	*NSTM Inspection Condition*	
B.C.15	*Underwater Inspection Condition*	
B.AP.01	*Approach Roadway Alignment*	F
B.AP.02	*Overtopping Likelihood*	0
B.AP.03	*Scour Vulnerability*	A
B.AP.04	*Scour Plan of Action*	0
B.AP.05	*Seismic Vulnerability*	B
B.W.01	*Year Built*	1974

Table 37. Features Data Sets for Bridge Number 15558X.

Item ID	Data Item	Value (1)	Value (2)	Value (3)	Value (4)	Value (5)
B.F.01	*Feature Type*	H01	H02	R01	W01	P01
B.F.02	*Feature Location*	C	B	B	B	C
B.F.03	*Feature Name*	North Hanley Road	Wabash Ave.	BNSF RR	Berkeley Branch Coldwater Creek	Sidewalk east and west sides
B.H.01	*Functional Classification*	3	7			
B.H.02	*Urban Code*	77770	77770			
B.H.03	*NHS Designation*	Y	N			
B.H.04	*National Highway Freight Network*	N	N			
B.H.05	*STRAHNET Designation*	N	N			
B.H.06	*LRS Route ID*	N	N			
B.H.07	*LRS Mile Point*					
B.H.08	*Lanes On Highway*	4	2			
B.H.09	*Annual Average Daily Traffic*	8376	300			
B.H.10	*Annual Average Daily Truck Traffic*	838	45			
B.H.11	*Year of Annual Average Daily Traffic*	2014	2014			
B.H.12	*Highway Maximum Usable Vertical Clearance*	99.9	22.4			
B.H.13	*Highway Minimum Vertical Clearance*	99.9	21.7			
B.H.14	*Highway Minimum Horizontal Clearance, Left*		0			
B.H.15	*Highway Minimum Horizontal Clearance, Right*		7.6			
B.H.16	*Highway Maximum Usable Surface Width*	64	22			
B.H.17	*Bypass Detour Length*	1	999			
B.H.18	*Crossing Bridge Number*					
B.RR.01	*Railroad Service Type*			F		
B.RR.02	*Railroad Minimum Vertical Clearance*			23.4		
B.RR.03	*Railroad Minimum Horizontal Offset*			14.0		
B.N.01	*Navigable Waterway*				N	
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*					

Table 38. Routes Data Sets for Bridge Number 15558X.

Item ID	Data Item	Value (1)	Value (2)
B.RT.01	*Route Designation*	R01	R02
B.RT.02	*Route Number*	0	0
B.RT.03	*Route Direction*	NS	EW
B.RT.04	*Route Type*	5	5
B.RT.05	*Service Type*	1	1

Table 39. Span Data Sets for Bridge Number 15558X.

Item ID	Data Item	Value (1)	Value (2)	Value (3)
B.SP.01	*Span Configuration Designation*	M01	M02	M03
B.SP.02	*Number of Spans*	3	1	3
B.SP.03	*Number of Beam Lines*	1	1	9
B.SP.04	*Span Material*	C01	C01	S01
B.SP.05	*Span Continuity*	2	4	2
B.SP.06	*Span Type*	S02	S02	G01
B.SP.07	*Span Protective System*	S02	S02	C01
B.SP.08	*Deck Interaction*	IM	IM	CU
B.SP.09	*Deck Material and Type*	C01	C01	C01
B.SP.10	*Wearing Surface*	C06	C06	C01
B.SP.11	*Deck Protective System*	C02	C02	C02
B.SP.12	*Deck Reinforcing Protective System*	S02	S02	C01
B.SP.13	*Deck Stay-In-Place Forms*	0	0	0

Table 40. Substructure Data Sets for Bridge Number 15558X.

Item ID	Data Item	Value (1)	Value (2)	Value (3)	Value (4)	Value (5)
B.SB.01	*Substructure Configuration Designation*	A01	A02	P01	P02	P03
B.SB.02	*Number of Substructure Units*	1	1	3	2	1
B.SB.03	*Substructure Material*	C01	C01	C01	C01	C01
B.SB.04	*Substructure Type*	A02	A05	B01	B02	B01
B.SB.05	*Substructure Protective System*	0	0	0	0	0
B.SB.06	*Foundation Type*	S02	S02	S02	S02	S02
B.SB.07	*Foundation Protective System*	0	0	0	0	0

Table 41. Posting Status Data Sets for Bridge Number 15558X.

Item ID	Data Item	Value (1)	Value (2)	Value (3)	Value (4)
B.PS.01	*Load Posting Status*	PD	PP	PM	PP
B.PS.02	*Posting Status Change Date*	20160214	20160415	20160723	20160905

Table 42. Posting Evaluation Data Sets for Bridge Number 15558X.

Item ID	Data Item	Value (1)	Value (2)	Value (3)	Value (4)	Value (5)	Value (6)	Value (7)
B.EP.01	*Legal Load Configuration*	3	3S2	3-3	SU4	SU5	SU6	SU7
B.EP.02	*Legal Load Rating Factor*	0.63	0.66	0.74	0.56	0.51	0.46	0.43
B.EP.03	*Posting Type*	T	T	T	T	T	T	T
B.EP.04	*Posting Value*	15	25	30	15	15	15	15

Table 43. Inspections Data Sets for Bridge Number 15558X.

Item ID	Data Item	Value (1)	Value (2)
B.IE.01	*Inspection Type*	2	7
B.IE.02	*Inspection Begin Date*	20160317	20160401
B.IE.03	*Inspection Completion Date*	20160318	20160401
B.IE.04	*Nationally Certified Bridge Inspector*	29KFF007	
B.IE.05	*Inspection Interval*	24	12
B.IE.06	*Inspection Due Date (Calculated by FHWA*)*	20180318*	20170401*
B.IE.07	*Risk-Based Inspection Interval Method*	1	N
B.IE.08	*Inspection Quality Control Date*	20160325	20160408
B.IE.09	*Inspection Quality Assurance Date*	20170317	
B.IE.10	*Inspection Data Update* Date	20160325	20160408
B.IE.11	*Inspection Note*		Inspected active cathodic protection system on spans 1 to 4. System operational.
B.IE.12	*Inspection Equipment*	A1|A11|I3	A1|IX

Table 44. Elements Data Sets for Bridge Number 15558X.

Item ID	B.E.01	B.E.02	B.E.03	B.CS.01	B.CS.02	B.CS.03	B.CS.04
Data Item	*Element Number*	*Element Parent Number*	*Element Total Quantity*	Element Quantity Condition State One	Element Quantity Condition State Two	Element Quantity Condition State Three	Element Quantity Condition State Four
Value (1)	12		14462	7431	7031	0	0
Value (2)	521	12	12550	0	5519	7031	0
Value (3)	38		15340	11474	3866	19	0
Value (4)	510	38	13312	6812	6500	0	0
Value (5)	521	510	13312	0	6812	6500	0
Value (6)	107		1755	1648	107	0	0
Value (7)	515	107	15287	10609	4628	0	50
Value (8)	205		21	14	7	0	0
Value (9)	210		122	122	0	0	0
Value (10)	215		230	117	113	0	0
Value (11)	234		223	223	0	0	0
Value (12)	300		78	0	0	78	0
Value (13)	310		27	14	13	0	0
Value (14)	515	310	333	0	233	0	100
Value (15)	311		8	0	8	0	0
Value (16)	515	311	62	0	32	0	30
Value (17)	312		9	9	0	0	0
Value (18)	314		9	0	9	0	0
Value (19)	515	314	61	0	31	0	30
Value (20)	331		806	427	379	0	0

Table 44 formatting is different than other tables for page fit purposes and indicates multiple element entries for a bridge.

Table 45. Work Data Sets for Bridge Number 15558X.

Item ID	**Data Item**	**Value (1)**	**Value (2)**	**Value (3)**
B.W.02	*Year Work Performed*	2015	2016	2017
B.W.03	*Work Performed*	SP6|DK1	DK4	0

APPENDIX B: INDEXES - DATA SETS, SECTIONS, AND ITEMS

Sorted by Data Set then Section				
Data Set	**Section**	**Item ID**	**Data Item Name**	**Format**
1 - Primary	1 - Bridge Identification	B.CL.01	Owner	AN (4)
1 - Primary	1 - Bridge Identification	B.CL.02	Maintenance Responsibility	AN (4)
1 - Primary	1 - Bridge Identification	B.CL.03	Federal or Tribal Land Access	AN (30)
1 - Primary	1 - Bridge Identification	B.CL.04	Historic Significance	AN (1)
1 - Primary	1 - Bridge Identification	B.CL.05	Toll	AN (1)
1 - Primary	1 - Bridge Identification	B.CL.06	Emergency Evacuation Designation	AN (1)
1 - Primary	1 - Bridge Identification	B.ID.01	Bridge Number	AN (15)
1 - Primary	1 - Bridge Identification	B.ID.02	Bridge Name	AN (300)
1 - Primary	1 - Bridge Identification	B.ID.03	Previous Bridge Number	AN (15)
1 - Primary	1 - Bridge Identification	B.L.01	State Code	N (2,0)
1 - Primary	1 - Bridge Identification	B.L.02	County Code	N (3,0)
1 - Primary	1 - Bridge Identification	B.L.03	Place Code	N (5,0)
1 - Primary	1 - Bridge Identification	B.L.04	Highway Agency District	AN (2)
1 - Primary	1 - Bridge Identification	B.L.05	Latitude	N (9,6)
1 - Primary	1 - Bridge Identification	B.L.06	Longitude	N (10,6)
1 - Primary	1 - Bridge Identification	B.L.07	Border Bridge Number	AN (15)
1 - Primary	1 - Bridge Identification	B.L.08	Border Bridge State or Country Code	AN (2)
1 - Primary	1 - Bridge Identification	B.L.09	Border Bridge Inspection Responsibility	AN (1)
1 - Primary	1 - Bridge Identification	B.L.10	Border Bridge Designated Lead State	N (2,0)
1 - Primary	1 - Bridge Identification	B.L.11	Bridge Location	AN (300)
1 - Primary	1 - Bridge Identification	B.L.12	Metropolitan Planning Organization	AN (300)
1 - Primary	2 - Bridge Material and Type	B.RH.01	Bridge Railings	AN (4)
1 - Primary	2 - Bridge Material and Type	B.RH.02	Transitions	AN (4)
1 - Primary	3 - Bridge Geometry	B.G.01	NBIS Bridge Length	N (7,1)
1 - Primary	3 - Bridge Geometry	B.G.02	Total Bridge Length	N (7,1)
1 - Primary	3 - Bridge Geometry	B.G.03	Maximum Span Length	N (5,1)
1 - Primary	3 - Bridge Geometry	B.G.04	Minimum Span Length	N (5,1)
1 - Primary	3 - Bridge Geometry	B.G.05	Bridge Width Out-to-Out	N (4,1)
1 - Primary	3 - Bridge Geometry	B.G.06	Bridge Width Curb-to-Curb	N (4,1)
1 - Primary	3 - Bridge Geometry	B.G.07	Left Curb or Sidewalk Width	N (3,1)
1 - Primary	3 - Bridge Geometry	B.G.08	Right Curb or Sidewalk Width	N (3,1)
1 - Primary	3 - Bridge Geometry	B.G.09	Approach Roadway Width	N (4,1)
1 - Primary	3 - Bridge Geometry	B.G.10	Bridge Median	AN (1)
1 - Primary	3 - Bridge Geometry	B.G.11	Skew	N (2,0)
1 - Primary	3 - Bridge Geometry	B.G.12	Curved Bridge	AN (2)
1 - Primary	3 - Bridge Geometry	B.G.13	Maximum Bridge Height	N (4,0)
1 - Primary	3 - Bridge Geometry	B.G.14	Sidehill Bridge	AN (1)
1 - Primary	3 - Bridge Geometry	B.G.15	Irregular Deck Area	N (10,1)

Sorted by Data Set then Section				
Data Set	**Section**	**Item ID**	**Data Item Name**	**Format**
1 - Primary	3 - Bridge Geometry	B.G.16	Calculated Deck Area	N (10,1)
1 - Primary	5 - Loads, Load Rating, and Posting	B.LR.01	Design Load	AN (8)
1 - Primary	5 - Loads, Load Rating, and Posting	B.LR.02	Design Method	AN (4)
1 - Primary	5 - Loads, Load Rating, and Posting	B.LR.03	Load Rating Date	YYYYMMDD
1 - Primary	5 - Loads, Load Rating, and Posting	B.LR.04	Load Rating Method	AN (4)
1 - Primary	5 - Loads, Load Rating, and Posting	B.LR.05	Inventory Load Rating Factor	N (4,2)
1 - Primary	5 - Loads, Load Rating, and Posting	B.LR.06	Operating Load Rating Factor	N (4,2)
1 - Primary	5 - Loads, Load Rating, and Posting	B.LR.07	Controlling Legal Load Rating Factor	N (4,2)
1 - Primary	5 - Loads, Load Rating, and Posting	B.LR.08	Routine Permit Loads	AN (1)
1 - Primary	6 - Inspections	B.IR.01	NSTM Inspection Required	AN (1)
1 - Primary	6 - Inspections	B.IR.02	Fatigue Details	AN (1)
1 - Primary	6 - Inspections	B.IR.03	Underwater Inspection Required	AN (1)
1 - Primary	6 - Inspections	B.IR.04	Complex Feature	AN (1)
1 - Primary	7 - Bridge Condition	B.AP.01	Approach Roadway Alignment	AN (1)
1 - Primary	7 - Bridge Condition	B.AP.02	Overtopping Likelihood	AN (1)
1 - Primary	7 - Bridge Condition	B.AP.03	Scour Vulnerability	AN (1)
1 - Primary	7 - Bridge Condition	B.AP.04	Scour Plan of Action	AN (1)
1 - Primary	7 - Bridge Condition	B.AP.05	Seismic Vulnerability	AN (1)
1 - Primary	7 - Bridge Condition	B.C.01	Deck Condition Rating	AN (1)
1 - Primary	7 - Bridge Condition	B.C.02	Superstructure Condition Rating	AN (1)
1 - Primary	7 - Bridge Condition	B.C.03	Substructure Condition Rating	AN (1)
1 - Primary	7 - Bridge Condition	B.C.04	Culvert Condition Rating	AN (1)
1 - Primary	7 - Bridge Condition	B.C.05	Bridge Railing Condition Rating	AN (1)
1 - Primary	7 - Bridge Condition	B.C.06	Bridge Railing Transitions Condition Rating	AN (1)
1 - Primary	7 - Bridge Condition	B.C.07	Bridge Bearings Condition Rating	AN (1)
1 - Primary	7 - Bridge Condition	B.C.08	Bridge Joints Condition Rating	AN (1)
1 - Primary	7 - Bridge Condition	B.C.09	Channel Condition Rating	AN (1)
1 - Primary	7 - Bridge Condition	B.C.10	Channel Protection Condition Rating	AN (1)
1 - Primary	7 - Bridge Condition	B.C.11	Scour Condition Rating	AN (1)
1 - Primary	7 - Bridge Condition	B.C.12	Bridge Condition Classification	AN (1)
1 - Primary	7 - Bridge Condition	B.C.13	Lowest Condition Rating Code	AN (1)
1 - Primary	7 - Bridge Condition	B.C.14	NSTM Inspection Condition	AN (1)
1 - Primary	7 - Bridge Condition	B.C.15	Underwater Inspection Condition	AN (1)
1 - Primary	7 - Bridge Condition	B.W.01	Year Built	N (4,0)
10 - Routes	4 - Features	B.RT.01	Route Designation (many-to-one)	AN (3)
10 - Routes	4 - Features	B.RT.02	Route Number	AN (15)
10 - Routes	4 - Features	B.RT.03	Route Direction	AN (2)
10 - Routes	4 - Features	B.RT.04	Route Type	AN (1)
10 - Routes	4 - Features	B.RT.05	Service Type	AN (1)
2 - Features	4 - Features	B.F.01	Feature Type (many-to-one)	AN (3)

Sorted by Data Set then Section				
Data Set	**Section**	**Item ID**	**Data Item Name**	**Format**
2 - Features	4 - Features	B.F.02	Feature Location	AN (1)
2 - Features	4 - Features	B.F.03	Feature Name	AN (300)
2 - Features	4 - Features	B.H.01	Functional Classification	AN (1)
2 - Features	4 - Features	B.H.02	Urban Code	AN (5)
2 - Features	4 - Features	B.H.03	NHS Designation	AN (1)
2 - Features	4 - Features	B.H.04	National Highway Freight Network	AN (1)
2 - Features	4 - Features	B.H.05	STRAHNET Designation	AN (1)
2 - Features	4 - Features	B.H.06	LRS Route ID	AN (120)
2 - Features	4 - Features	B.H.07	LRS Mile Point	N (8,3)
2 - Features	4 - Features	B.H.08	Lanes on Highway	N (2,0)
2 - Features	4 - Features	B.H.09	Annual Average Daily Traffic	N (8,0)
2 - Features	4 - Features	B.H.10	Annual Average Daily Truck Traffic	N (8,0)
2 - Features	4 - Features	B.H.11	Year of Annual Average Daily Traffic	N (4,0)
2 - Features	4 - Features	B.H.12	Highway Maximum Usable Vertical Clearance	N (3,1)
2 - Features	4 - Features	B.H.13	Highway Minimum Vertical Clearance	N (3,1)
2 - Features	4 - Features	B.H.14	Highway Minimum Horizontal Clearance, Left	N (3,1)
2 - Features	4 - Features	B.H.15	Highway Minimum Horizontal Clearance, Right	N (3,1)
2 - Features	4 - Features	B.H.16	Highway Maximum Usable Surface Width	N (3,1)
2 - Features	4 - Features	B.H.17	Bypass Detour Length	N (3,0)
2 - Features	4 - Features	B.H.18	Crossing Bridge Number	AN (15)
2 - Features	4 - Features	B.N.01	Navigable Waterway	AN (1)
2 - Features	4 - Features	B.N.02	Navigation Minimum Vertical Clearance	N (4,1)
2 - Features	4 - Features	B.N.03	Movable Bridge Maximum Navigation Vertical Clearance	N (4,1)
2 - Features	4 - Features	B.N.04	Navigation Channel Width	N (5,1)
2 - Features	4 - Features	B.N.05	Navigation Channel Minimum Horizontal Clearance	N (5,1)
2 - Features	4 - Features	B.N.06	Substructure Navigation Protection	AN (1)
2 - Features	4 - Features	B.RR.01	Railroad Service Type	AN (2)
2 - Features	4 - Features	B.RR.02	Railroad Minimum Vertical Clearance	N (3,1)
2 - Features	4 - Features	B.RR.03	Railroad Minimum Horizontal Offset	N (3,1)
3 - Span Sets	2 - Bridge Material and Type	B.SP.01	Span Configuration Designation (many-to-one)	AN (3)
3 - Span Sets	2 - Bridge Material and Type	B.SP.02	Number of Spans	N (4,0)
3 - Span Sets	2 - Bridge Material and Type	B.SP.03	Number of Beam Lines	N (3,0)
3 - Span Sets	2 - Bridge Material and Type	B.SP.04	Span Material	AN (3)
3 - Span Sets	2 - Bridge Material and Type	B.SP.05	Span Continuity	AN (1)
3 - Span Sets	2 - Bridge Material and Type	B.SP.06	Span Type	AN (3)
3 - Span Sets	2 - Bridge Material and Type	B.SP.07	Span Protective System	AN (3)
3 - Span Sets	2 - Bridge Material and Type	B.SP.08	Deck Interaction	AN (2)
3 - Span Sets	2 - Bridge Material and Type	B.SP.09	Deck Material and Type	AN (3)
3 - Span Sets	2 - Bridge Material and Type	B.SP.10	Wearing Surface	AN (3)

Sorted by Data Set then Section				
Data Set	**Section**	**Item ID**	**Data Item Name**	**Format**
3 - Span Sets	2 - Bridge Material and Type	B.SP.11	Deck Protective System	AN (3)
3 - Span Sets	2 - Bridge Material and Type	B.SP.12	Deck Reinforcing Protective System	AN (3)
3 - Span Sets	2 - Bridge Material and Type	B.SP.13	Deck Stay-in-Place Forms	AN (3)
4 - Substructure Sets	2 - Bridge Material and Type	B.SB.01	Substructure Configuration Designation (many-to-one)	AN (3)
4 - Substructure Sets	2 - Bridge Material and Type	B.SB.02	Number of Substructure Units	N (3,0)
4 - Substructure Sets	2 - Bridge Material and Type	B.SB.03	Substructure Material	AN (2)
4 - Substructure Sets	2 - Bridge Material and Type	B.SB.04	Substructure Type	AN (3)
4 - Substructure Sets	2 - Bridge Material and Type	B.SB.05	Substructure Protective System	AN (2)
4 - Substructure Sets	2 - Bridge Material and Type	B.SB.06	Foundation Type	AN (2)
4 - Substructure Sets	2 - Bridge Material and Type	B.SB.07	Foundation Protective System	AN (2)
5 - Posting Status	5 - Loads, Load Rating, and Posting	B.PS.01	Load Posting Status (many-to-one)	AN (2)
5 - Posting Status	5 - Loads, Load Rating, and Posting	B.PS.02	Posting Status Change Date	YYYYMMDD
6 - Posting Evaluation	5 - Loads, Load Rating, and Posting	B.EP.01	Legal Load Configuration (many-to-one)	AN (3)
6 - Posting Evaluation	5 - Loads, Load Rating, and Posting	B.EP.03	Posting Type	AN (1)
6 - Posting Evaluation	5 - Loads, Load Rating, and Posting	B.EP.04	Posting Value	N (2,0)
6 – Posting Evaluation	5 - Loads, Load Rating, and Posting	B.EP.02	Legal Load Rating Factor	N (4,2)
7 - Inspections	6 – Inspections	B.IE.01	Inspection Type (many-to-one)	AN (1)
7 - Inspections	6 – Inspections	B.IE.02	Inspection Begin Date	YYYYMMDD
7 - Inspections	6 – Inspections	B.IE.03	Inspection Completion Date	YYYYMMDD
7 - Inspections	6 – Inspections	B.IE.04	Nationally Certified Bridge Inspector	AN (15)
7 - Inspections	6 – Inspections	B.IE.05	Inspection Interval	N (2,0)
7 - Inspections	6 – Inspections	B.IE.06	Inspection Due Date	YYYYMMDD
7 - Inspections	6 – Inspections	B.IE.07	Risk-Based Inspection Interval Method	AN (1)
7 - Inspections	6 – Inspections	B.IE.08	Inspection Quality Control Date	YYYYMMDD
7 - Inspections	6 – Inspections	B.IE.09	Inspection Quality Assurance Date	YYYYMMDD
7 - Inspections	6 – Inspections	B.IE.10	Inspection Data Update Date	YYYYMMDD
7 - Inspections	6 – Inspections	B.IE.11	Inspection Note	AN (300)
7 - Inspections	6 – Inspections	B.IE.12	Inspection Equipment	AN (120)
8 - Elements	7 - Bridge Condition	B.CS.01	Element Quantity Condition State One	N (8,0)
8 - Elements	7 - Bridge Condition	B.CS.02	Element Quantity Condition State Two	N (8,0)
8 - Elements	7 - Bridge Condition	B.CS.03	Element Quantity Condition State Three	N (8,0)
8 - Elements	7 - Bridge Condition	B.CS.04	Element Quantity Condition State Four	N (8,0)
8 - Elements	7 - Bridge Condition	B.E.01	Element Number (many-to-one)	N (4,0)
8 - Elements	7 - Bridge Condition	B.E.02	Element Parent Number	N (4,0)
8 - Elements	7 - Bridge Condition	B.E.03	Element Total Quantity	N (8,0)
9 - Work	7 - Bridge Condition	B.W.02	Year Work Performed (many -to-one)	N (4,0)
9 - Work	7 - Bridge Condition	B.W.03	Work Performed	AN (120)

Sorted by Item ID

Item ID	Data Item Name	Format	Data Set	Section
B.AP.01	Approach Roadway Alignment	AN (1)	1 - Primary	7 - Bridge Condition
B.AP.02	Overtopping Likelihood	AN (1)	1 - Primary	7 - Bridge Condition
B.AP.03	Scour Vulnerability	AN (1)	1 - Primary	7 - Bridge Condition
B.AP.04	Scour Plan of Action	AN (1)	1 - Primary	7 - Bridge Condition
B.AP.05	Seismic Vulnerability	AN (1)	1 - Primary	7 - Bridge Condition
B.C.01	Deck Condition Rating	AN (1)	1 - Primary	7 - Bridge Condition
B.C.02	Superstructure Condition Rating	AN (1)	1 - Primary	7 - Bridge Condition
B.C.03	Substructure Condition Rating	AN (1)	1 - Primary	7 - Bridge Condition
B.C.04	Culvert Condition Rating	AN (1)	1 - Primary	7 - Bridge Condition
B.C.05	Bridge Railing Condition Rating	AN (1)	1 - Primary	7 - Bridge Condition
B.C.06	Bridge Railing Transitions Condition Rating	AN (1)	1 - Primary	7 - Bridge Condition
B.C.07	Bridge Bearings Condition Rating	AN (1)	1 - Primary	7 - Bridge Condition
B.C.08	Bridge Joints Condition Rating	AN (1)	1 - Primary	7 - Bridge Condition
B.C.09	Channel Condition Rating	AN (1)	1 - Primary	7 - Bridge Condition
B.C.10	Channel Protection Condition Rating	AN (1)	1 - Primary	7 - Bridge Condition
B.C.11	Scour Condition Rating	AN (1)	1 - Primary	7 - Bridge Condition
B.C.12	Bridge Condition Classification	AN (1)	1 - Primary	7 - Bridge Condition
B.C.13	Lowest Condition Rating Code	AN (1)	1 - Primary	7 - Bridge Condition
B.C.14	NSTM Inspection Condition	AN (1)	1 - Primary	7 - Bridge Condition
B.C.15	Underwater Inspection Condition	AN (1)	1 - Primary	7 - Bridge Condition
B.CL.01	Owner	AN (4)	1 - Primary	1 - Bridge Identification
B.CL.02	Maintenance Responsibility	AN (4)	1 - Primary	1 - Bridge Identification
B.CL.03	Federal or Tribal Land Access	AN (30)	1 - Primary	1 - Bridge Identification
B.CL.04	Historic Significance	AN (1)	1 - Primary	1 - Bridge Identification
B.CL.05	Toll	AN (1)	1 - Primary	1 - Bridge Identification
B.CL.06	Emergency Evacuation Designation	AN (1)	1 - Primary	1 - Bridge Identification
B.CS.01	Element Quantity Condition State One	N (8,0)	8 - Elements	7 - Bridge Condition
B.CS.02	Element Quantity Condition State Two	N (8,0)	8 - Elements	7 - Bridge Condition
B.CS.03	Element Quantity Condition State Three	N (8,0)	8 - Elements	7 - Bridge Condition
B.CS.04	Element Quantity Condition State Four	N (8,0)	8 - Elements	7 - Bridge Condition
B.E.01	Element Number (many-to-one)	N (4,0)	8 - Elements	7 - Bridge Condition
B.E.02	Element Parent Number	N (4,0)	8 - Elements	7 - Bridge Condition
B.E.03	Element Total Quantity	N (8,0)	8 - Elements	7 - Bridge Condition
B.EP.01	Legal Load Configuration (many-to-one)	AN (3)	6 - Posting Evaluation	5 - Loads, Load Rating, and Posting
B.EP.02	Legal Load Rating Factor	N (4,2)	6 – Posting Evaluation	5 - Loads, Load Rating, and Posting
B.EP.03	Posting Type	AN (1)	6 - Posting Evaluation	5 - Loads, Load Rating, and Posting
B.EP.04	Posting Value	N (2,0)	6 - Posting Evaluation	5 - Loads, Load Rating, and Posting
B.F.01	Feature Type (many-to-one)	AN (3)	2 - Features	4 - Features
B.F.02	Feature Location	AN (1)	2 - Features	4 - Features
B.F.03	Feature Name	AN (300)	2 - Features	4 - Features

Sorted by Item ID

Item ID	Data Item Name	Format	Data Set	Section
B.G.01	NBIS Bridge Length	N (7,1)	1 - Primary	3 - Bridge Geometry
B.G.02	Total Bridge Length	N (7,1)	1 - Primary	3 - Bridge Geometry
B.G.03	Maximum Span Length	N (5,1)	1 - Primary	3 - Bridge Geometry
B.G.04	Minimum Span Length	N (5,1)	1 - Primary	3 - Bridge Geometry
B.G.05	Bridge Width Out-to-Out	N (4,1)	1 - Primary	3 - Bridge Geometry
B.G.06	Bridge Width Curb-to-Curb	N (4,1)	1 - Primary	3 - Bridge Geometry
B.G.07	Left Curb or Sidewalk Width	N (3,1)	1 - Primary	3 - Bridge Geometry
B.G.08	Right Curb or Sidewalk Width	N (3,1)	1 - Primary	3 - Bridge Geometry
B.G.09	Approach Roadway Width	N (4,1)	1 - Primary	3 - Bridge Geometry
B.G.10	Bridge Median	AN (1)	1 - Primary	3 - Bridge Geometry
B.G.11	Skew	N (2,0)	1 - Primary	3 - Bridge Geometry
B.G.12	Curved Bridge	AN (2)	1 - Primary	3 - Bridge Geometry
B.G.13	Maximum Bridge Height	N (4,0)	1 - Primary	3 - Bridge Geometry
B.G.14	Sidehill Bridge	AN (1)	1 - Primary	3 - Bridge Geometry
B.G.15	Irregular Deck Area	N (10,1)	1 - Primary	3 - Bridge Geometry
B.G.16	Calculated Deck Area	N (10,1)	1 - Primary	3 - Bridge Geometry
B.H.01	Functional Classification	AN (1)	2 - Features	4 - Features
B.H.02	Urban Code	AN (5)	2 - Features	4 - Features
B.H.03	NHS Designation	AN (1)	2 - Features	4 - Features
B.H.04	National Highway Freight Network	AN (1)	2 - Features	4 - Features
B.H.05	STRAHNET Designation	AN (1)	2 - Features	4 - Features
B.H.06	LRS Route ID	AN (120)	2 - Features	4 - Features
B.H.07	LRS Mile Point	N (8,3)	2 - Features	4 - Features
B.H.08	Lanes on Highway	N (2,0)	2 - Features	4 - Features
B.H.09	Annual Average Daily Traffic	N (8,0)	2 - Features	4 - Features
B.H.10	Annual Average Daily Truck Traffic	N (8,0)	2 - Features	4 - Features
B.H.11	Year of Annual Average Daily Traffic	N (4,0)	2 - Features	4 - Features
B.H.12	Highway Maximum Usable Vertical Clearance	N (3,1)	2 - Features	4 - Features
B.H.13	Highway Minimum Vertical Clearance	N (3,1)	2 - Features	4 - Features
B.H.14	Highway Minimum Horizontal Clearance, Left	N (3,1)	2 - Features	4 - Features
B.H.15	Highway Minimum Horizontal Clearance, Right	N (3,1)	2 - Features	4 - Features
B.H.16	Highway Maximum Usable Surface Width	N (3,1)	2 - Features	4 - Features
B.H.17	Bypass Detour Length	N (3,0)	2 - Features	4 - Features
B.H.18	Crossing Bridge Number	AN (15)	2 - Features	4 - Features
B.ID.01	Bridge Number	AN (15)	1 - Primary	1 - Bridge Identification
B.ID.02	Bridge Name	AN (300)	1 - Primary	1 - Bridge Identification
B.ID.03	Previous Bridge Number	AN (15)	1 - Primary	1 - Bridge Identification
B.IE.01	Inspection Type (many-to-one)	AN (1)	7 - Inspections	6 – Inspections
B.IE.02	Inspection Begin Date	YYYYMMDD	7 - Inspections	6 – Inspections

Sorted by Item ID

Item ID	Data Item Name	Format	Data Set	Section
B.IE.03	Inspection Completion Date	YYYYMMDD	7 - Inspections	6 – Inspections
B.IE.04	Nationally Certified Bridge Inspector	AN (15)	7 - Inspections	6 – Inspections
B.IE.05	Inspection Interval	N (2,0)	7 - Inspections	6 – Inspections
B.IE.06	Inspection Due Date	YYYYMMDD	7 - Inspections	6 – Inspections
B.IE.07	Risk-Based Inspection Interval Method	AN (1)	7 - Inspections	6 – Inspections
B.IE.08	Inspection Quality Control Date	YYYYMMDD	7 - Inspections	6 – Inspections
B.IE.09	Inspection Quality Assurance Date	YYYYMMDD	7 - Inspections	6 – Inspections
B.IE.10	Inspection Data Update Date	YYYYMMDD	7 - Inspections	6 – Inspections
B.IE.11	Inspection Note	AN (300)	7 - Inspections	6 – Inspections
B.IE.12	Inspection Equipment	AN (120)	7 - Inspections	6 – Inspections
B.IR.01	NSTM Inspection Required	AN (1)	1 - Primary	6 - Inspections
B.IR.02	Fatigue Details	AN (1)	1 - Primary	6 - Inspections
B.IR.03	Underwater Inspection Required	AN (1)	1 - Primary	6 - Inspections
B.IR.04	Complex Feature	AN (1)	1 - Primary	6 - Inspections
B.L.01	State Code	N (2,0)	1 - Primary	1 - Bridge Identification
B.L.02	County Code	N (3,0)	1 - Primary	1 - Bridge Identification
B.L.03	Place Code	N (5,0)	1 - Primary	1 - Bridge Identification
B.L.04	Highway Agency District	AN (2)	1 - Primary	1 - Bridge Identification
B.L.05	Latitude	N (9,6)	1 - Primary	1 - Bridge Identification
B.L.06	Longitude	N (10,6)	1 - Primary	1 - Bridge Identification
B.L.07	Border Bridge Number	AN (15)	1 - Primary	1 - Bridge Identification
B.L.08	Border Bridge State or Country Code	AN (2)	1 - Primary	1 - Bridge Identification
B.L.09	Border Bridge Inspection Responsibility	AN (1)	1 - Primary	1 - Bridge Identification
B.L.10	Border Bridge Designated Lead State	N (2,0)	1 - Primary	1 - Bridge Identification
B.L.11	Bridge Location	AN (300)	1 - Primary	1 - Bridge Identification
B.L.12	Metropolitan Planning Organization	AN (300)	1 - Primary	1 - Bridge Identification
B.LR.01	Design Load	AN (8)	1 - Primary	5 - Loads, Load Rating, and Posting
B.LR.02	Design Method	AN (4)	1 - Primary	5 - Loads, Load Rating, and Posting
B.LR.03	Load Rating Date	YYYYMMDD	1 - Primary	5 - Loads, Load Rating, and Posting
B.LR.04	Load Rating Method	AN (4)	1 - Primary	5 - Loads, Load Rating, and Posting
B.LR.05	Inventory Load Rating Factor	N (4,2)	1 - Primary	5 - Loads, Load Rating, and Posting
B.LR.06	Operating Load Rating Factor	N (4,2)	1 - Primary	5 - Loads, Load Rating, and Posting
B.LR.07	Controlling Legal Load Rating Factor	N (4,2)	1 - Primary	5 - Loads, Load Rating, and Posting
B.LR.08	Routine Permit Loads	AN (1)	1 - Primary	5 - Loads, Load Rating, and Posting
B.N.01	Navigable Waterway	AN (1)	2 - Features	4 - Features
B.N.02	Navigation Minimum Vertical Clearance	N (4,1)	2 - Features	4 - Features
B.N.03	Movable Bridge Maximum Navigation Vertical Clearance	N (4,1)	2 - Features	4 - Features
B.N.04	Navigation Channel Width	N (5,1)	2 - Features	4 - Features
B.N.05	Navigation Channel Minimum Horizontal Clearance	N (5,1)	2 - Features	4 - Features

Sorted by Item ID				
Item ID	**Data Item Name**	**Format**	**Data Set**	**Section**
B.N.06	Substructure Navigation Protection	AN (1)	2 - Features	4 - Features
B.PS.01	Load Posting Status (many-to-one)	AN (2)	5 - Posting Status	5 - Loads, Load Rating, and Posting
B.PS.02	Posting Status Change Date	YYYYMMDD	5 - Posting Status	5 - Loads, Load Rating, and Posting
B.RH.01	Bridge Railings	AN (4)	1 - Primary	2 - Bridge Material and Type
B.RH.02	Transitions	AN (4)	1 - Primary	2 - Bridge Material and Type
B.RR.01	Railroad Service Type	AN (2)	2 - Features	4 - Features
B.RR.02	Railroad Minimum Vertical Clearance	N (3,1)	2 - Features	4 - Features
B.RR.03	Railroad Minimum Horizontal Offset	N (3,1)	2 - Features	4 - Features
B.RT.01	Route Designation (many-to-one)	AN (3)	10 - Routes	4 - Features
B.RT.02	Route Number	AN (15)	10 - Routes	4 - Features
B.RT.03	Route Direction	AN (2)	10 - Routes	4 - Features
B.RT.04	Route Type	AN (1)	10 - Routes	4 - Features
B.RT.05	Service Type	AN (1)	10 - Routes	4 - Features
B.SB.01	Substructure Configuration Designation (many-to-one)	AN (3)	4 - Substructure Sets	2 - Bridge Material and Type
B.SB.02	Number of Substructure Units	N (3,0)	4 - Substructure Sets	2 - Bridge Material and Type
B.SB.03	Substructure Material	AN (2)	4 - Substructure Sets	2 - Bridge Material and Type
B.SB.04	Substructure Type	AN (3)	4 - Substructure Sets	2 - Bridge Material and Type
B.SB.05	Substructure Protective System	AN (2)	4 - Substructure Sets	2 - Bridge Material and Type
B.SB.06	Foundation Type	AN (2)	4 - Substructure Sets	2 - Bridge Material and Type
B.SB.07	Foundation Protective System	AN (2)	4 - Substructure Sets	2 - Bridge Material and Type
B.SP.01	Span Configuration Designation (many-to-one)	AN (3)	3 - Span Sets	2 - Bridge Material and Type
B.SP.02	Number of Spans	N (4,0)	3 - Span Sets	2 - Bridge Material and Type
B.SP.03	Number of Beam Lines	N (3,0)	3 - Span Sets	2 - Bridge Material and Type
B.SP.04	Span Material	AN (3)	3 - Span Sets	2 - Bridge Material and Type
B.SP.05	Span Continuity	AN (1)	3 - Span Sets	2 - Bridge Material and Type
B.SP.06	Span Type	AN (3)	3 - Span Sets	2 - Bridge Material and Type
B.SP.07	Span Protective System	AN (3)	3 - Span Sets	2 - Bridge Material and Type
B.SP.08	Deck Interaction	AN (2)	3 - Span Sets	2 - Bridge Material and Type
B.SP.09	Deck Material and Type	AN (3)	3 - Span Sets	2 - Bridge Material and Type
B.SP.10	Wearing Surface	AN (3)	3 - Span Sets	2 - Bridge Material and Type
B.SP.11	Deck Protective System	AN (3)	3 - Span Sets	2 - Bridge Material and Type
B.SP.12	Deck Reinforcing Protective System	AN (3)	3 - Span Sets	2 - Bridge Material and Type
B.SP.13	Deck Stay-in-Place Forms	AN (3)	3 - Span Sets	2 - Bridge Material and Type
B.W.01	Year Built	N (4,0)	1 - Primary	7 - Bridge Condition
B.W.02	Year Work Performed (many -to-one)	N (4,0)	9 - Work	7 - Bridge Condition
B.W.03	Work Performed	AN (120)	9 - Work	7 - Bridge Condition

Sorted by Data Item Name				
Data Item Name	**Item ID**	**Format**	**Section**	**Data Set**
Annual Average Daily Traffic	B.H.09	N (8,0)	4 - Features	2 - Features
Annual Average Daily Truck Traffic	B.H.10	N (8,0)	4 - Features	2 - Features
Approach Roadway Alignment	B.AP.01	AN (1)	7 - Bridge Condition	1 - Primary
Approach Roadway Width	B.G.09	N (4,1)	3 - Bridge Geometry	1 - Primary
Border Bridge Designated Lead State	B.L.10	N (2,0)	1 - Bridge Identification	1 - Primary
Border Bridge Inspection Responsibility	B.L.09	AN (1)	1 - Bridge Identification	1 - Primary
Border Bridge Number	B.L.07	AN (15)	1 - Bridge Identification	1 - Primary
Border Bridge State or Country Code	B.L.08	AN (2)	1 - Bridge Identification	1 - Primary
Bridge Bearings Condition Rating	B.C.07	AN (1)	7 - Bridge Condition	1 - Primary
Bridge Condition Classification	B.C.12	AN (1)	7 - Bridge Condition	1 - Primary
Bridge Joints Condition Rating	B.C.08	AN (1)	7 - Bridge Condition	1 - Primary
Bridge Location	B.L.11	AN (300)	1 - Bridge Identification	1 - Primary
Bridge Median	B.G.10	AN (1)	3 - Bridge Geometry	1 - Primary
Bridge Name	B.ID.02	AN (300)	1 - Bridge Identification	1 - Primary
Bridge Number	B.ID.01	AN (15)	1 - Bridge Identification	1 - Primary
Bridge Railing Condition Rating	B.C.05	AN (1)	7 - Bridge Condition	1 - Primary
Bridge Railing Transitions Condition Rating	B.C.06	AN (1)	7 - Bridge Condition	1 - Primary
Bridge Railings	B.RH.01	AN (4)	2 - Bridge Material and Type	1 - Primary
Bridge Width Curb-to-Curb	B.G.06	N (4,1)	3 - Bridge Geometry	1 - Primary
Bridge Width Out-to-Out	B.G.05	N (4,1)	3 - Bridge Geometry	1 - Primary
Bypass Detour Length	B.H.17	N (3,0)	4 - Features	2 - Features
Calculated Deck Area	B.G.16	N (10,1)	3 - Bridge Geometry	1 - Primary
Channel Condition Rating	B.C.09	AN (1)	7 - Bridge Condition	1 - Primary
Channel Protection Condition Rating	B.C.10	AN (1)	7 - Bridge Condition	1 - Primary
Complex Feature	B.IR.04	AN (1)	6 - Inspections	1 - Primary
Controlling Legal Load Rating Factor	B.LR.07	N (4,2)	5 - Loads, Load Rating, and Posting	1 - Primary
County Code	B.L.02	N (3,0)	1 - Bridge Identification	1 - Primary
Crossing Bridge Number	B.H.18	AN (15)	4 - Features	2 - Features
Culvert Condition Rating	B.C.04	AN (1)	7 - Bridge Condition	1 - Primary
Curved Bridge	B.G.12	AN (2)	3 - Bridge Geometry	1 - Primary
Deck Condition Rating	B.C.01	AN (1)	7 - Bridge Condition	1 - Primary
Deck Interaction	B.SP.08	AN (2)	2 - Bridge Material and Type	3 - Span Sets
Deck Material and Type	B.SP.09	AN (3)	2 - Bridge Material and Type	3 - Span Sets
Deck Protective System	B.SP.11	AN (3)	2 - Bridge Material and Type	3 - Span Sets
Deck Reinforcing Protective System	B.SP.12	AN (3)	2 - Bridge Material and Type	3 - Span Sets
Deck Stay-in-Place Forms	B.SP.13	AN (3)	2 - Bridge Material and Type	3 - Span Sets
Design Load	B.LR.01	AN (8)	5 - Loads, Load Rating, and Posting	1 - Primary
Design Method	B.LR.02	AN (4)	5 - Loads, Load Rating, and Posting	1 - Primary
Element Number (many-to-one)	B.E.01	N (4,0)	7 - Bridge Condition	8 - Elements

Sorted by Data Item Name				
Data Item Name	**Item ID**	**Format**	**Section**	**Data Set**
Element Parent Number	B.E.02	N (4,0)	7 - Bridge Condition	8 - Elements
Element Quantity Condition State Four	B.CS.04	N (8,0)	7 - Bridge Condition	8 - Elements
Element Quantity Condition State One	B.CS.01	N (8,0)	7 - Bridge Condition	8 - Elements
Element Quantity Condition State Three	B.CS.03	N (8,0)	7 - Bridge Condition	8 - Elements
Element Quantity Condition State Two	B.CS.02	N (8,0)	7 - Bridge Condition	8 - Elements
Element Total Quantity	B.E.03	N (8,0)	7 - Bridge Condition	8 - Elements
Emergency Evacuation Designation	B.CL.06	AN (1)	1 - Bridge Identification	1 - Primary
Fatigue Details	B.IR.02	AN (1)	6 - Inspections	1 - Primary
Feature Location	B.F.02	AN (1)	4 - Features	2 - Features
Feature Name	B.F.03	AN (300)	4 - Features	2 - Features
Feature Type (many-to-one)	B.F.01	AN (3)	4 - Features	2 - Features
Federal or Tribal Land Access	B.CL.03	AN (30)	1 - Bridge Identification	1 - Primary
Foundation Protective System	B.SB.07	AN (2)	2 - Bridge Material and Type	4 - Substructure Sets
Foundation Type	B.SB.06	AN (2)	2 - Bridge Material and Type	4 - Substructure Sets
Functional Classification	B.H.01	AN (1)	4 - Features	2 - Features
Highway Maximum Usable Surface Width	B.H.16	N (3,1)	4 - Features	2 - Features
Highway Maximum Usable Vertical Clearance	B.H.12	N (3,1)	4 - Features	2 - Features
Highway Minimum Horizontal Clearance, Left	B.H.14	N (3,1)	4 - Features	2 - Features
Highway Minimum Horizontal Clearance, Right	B.H.15	N (3,1)	4 - Features	2 - Features
Highway Minimum Vertical Clearance	B.H.13	N (3,1)	4 - Features	2 - Features
Highway Agency District	B.L.04	AN (2)	1 - Bridge Identification	1 - Primary
Historic Significance	B.CL.04	AN (1)	1 - Bridge Identification	1 - Primary
Inspection Begin Date	B.IE.02	YYYYMMDD	6 – Inspections	7 - Inspections
Inspection Completion Date	B.IE.03	YYYYMMDD	6 – Inspections	7 - Inspections
Inspection Data Update Date	B.IE.10	YYYYMMDD	6 – Inspections	7 - Inspections
Inspection Due Date	B.IE.06	YYYYMMDD	6 – Inspections	7 - Inspections
Inspection Equipment	B.IE.12	AN (120)	6 – Inspections	7 - Inspections
Inspection Interval	B.IE.05	N (2,0)	6 – Inspections	7 - Inspections
Inspection Note	B.IE.11	AN (300)	6 – Inspections	7 - Inspections
Inspection Quality Assurance Date	B.IE.09	YYYYMMDD	6 – Inspections	7 - Inspections
Inspection Quality Control Date	B.IE.08	YYYYMMDD	6 – Inspections	7 - Inspections
Inspection Type (many-to-one)	B.IE.01	AN (1)	6 – Inspections	7 - Inspections
Inventory Load Rating Factor	B.LR.05	N (4,2)	5 - Loads, Load Rating, and Posting	1 - Primary
Irregular Deck Area	B.G.15	N (10,1)	3 - Bridge Geometry	1 - Primary
Lanes on Highway	B.H.08	N (2,0)	4 - Features	2 - Features
Latitude	B.L.05	N (9,6)	1 - Bridge Identification	1 - Primary
Left Curb or Sidewalk Width	B.G.07	N (3,1)	3 - Bridge Geometry	1 - Primary
Legal Load Configuration (many-to-one)	B.EP.01	AN (3)	5 - Loads, Load Rating, and Posting	6 - Posting Evaluation
Legal Load Rating Factor	B.EP.02	N (4,2)	5 - Loads, Load Rating, and Posting	6 – Posting Evaluation

Sorted by Data Item Name				
Data Item Name	Item ID	Format	Section	Data Set
Load Posting Status (many-to-one)	B.PS.01	AN (2)	5 - Loads, Load Rating, and Posting	5 - Posting Status
Load Rating Date	B.LR.03	YYYYMMDD	5 - Loads, Load Rating, and Posting	1 - Primary
Load Rating Method	B.LR.04	AN (4)	5 - Loads, Load Rating, and Posting	1 - Primary
Longitude	B.L.06	N (10,6)	1 - Bridge Identification	1 - Primary
Lowest Condition Rating Code	B.C.13	AN (1)	7 - Bridge Condition	1 - Primary
LRS Mile Point	B.H.07	N (8,3)	4 - Features	2 - Features
LRS Route ID	B.H.06	AN (120)	4 - Features	2 - Features
Maintenance Responsibility	B.CL.02	AN (4)	1 - Bridge Identification	1 - Primary
Maximum Bridge Height	B.G.13	N (4,0)	3 - Bridge Geometry	1 - Primary
Maximum Span Length	B.G.03	N (5,1)	3 - Bridge Geometry	1 - Primary
Metropolitan Planning Organization	B.L.12	AN (300)	1 - Bridge Identification	1 - Primary
Minimum Span Length	B.G.04	N (5,1)	3 - Bridge Geometry	1 - Primary
Movable Bridge Maximum Navigation Vertical Clearance	B.N.03	N (4,1)	4 - Features	2 - Features
National Highway Freight Network	B.H.04	AN (1)	4 - Features	2 - Features
Nationally Certified Bridge Inspector	B.IE.04	AN (15)	6 – Inspections	7 - Inspections
Navigable Waterway	B.N.01	AN (1)	4 - Features	2 - Features
Navigation Channel Minimum Horizontal Clearance	B.N.05	N (5,1)	4 - Features	2 - Features
Navigation Channel Width	B.N.04	N (5,1)	4 - Features	2 - Features
Navigation Minimum Vertical Clearance	B.N.02	N (4,1)	4 - Features	2 - Features
NBIS Bridge Length	B.G.01	N (7,1)	3 - Bridge Geometry	1 - Primary
NHS Designation	B.H.03	AN (1)	4 - Features	2 - Features
NSTM Inspection Condition	B.C.14	AN (1)	7 - Bridge Condition	1 - Primary
NSTM Inspection Required	B.IR.01	AN (1)	6 - Inspections	1 - Primary
Number of Beam Lines	B.SP.03	N (3,0)	2 - Bridge Material and Type	3 - Span Sets
Number of Spans	B.SP.02	N (4,0)	2 - Bridge Material and Type	3 - Span Sets
Number of Substructure Units	B.SB.02	N (3,0)	2 - Bridge Material and Type	4 - Substructure Sets
Operating Load Rating Factor	B.LR.06	N (4,2)	5 - Loads, Load Rating, and Posting	1 - Primary
Overtopping Likelihood	B.AP.02	AN (1)	7 - Bridge Condition	1 - Primary
Owner	B.CL.01	AN (4)	1 - Bridge Identification	1 - Primary
Place Code	B.L.03	N (5,0)	1 - Bridge Identification	1 - Primary
Posting Status Change Date	B.PS.02	YYYYMMDD	5 - Loads, Load Rating, and Posting	5 - Posting Status
Posting Type	B.EP.03	AN (1)	5 - Loads, Load Rating, and Posting	6 - Posting Evaluation
Posting Value	B.EP.04	N (2,0)	5 - Loads, Load Rating, and Posting	6 - Posting Evaluation
Previous Bridge Number	B.ID.03	AN (15)	1 - Bridge Identification	1 - Primary
Railroad Minimum Horizontal Offset	B.RR.03	N (3,1)	4 - Features	2 - Features
Railroad Minimum Vertical Clearance	B.RR.02	N (3,1)	4 - Features	2 - Features
Railroad Service Type	B.RR.01	AN (2)	4 - Features	2 - Features
Right Curb or Sidewalk Width	B.G.08	N (3,1)	3 - Bridge Geometry	1 - Primary
Risk-Based Inspection Interval Method	B.IE.07	AN (1)	6 – Inspections	7 - Inspections

Sorted by Data Item Name				
Data Item Name	**Item ID**	**Format**	**Section**	**Data Set**
Route Designation (many-to-one)	B.RT.01	AN (3)	4 - Features	10 - Routes
Route Direction	B.RT.03	AN (2)	4 - Features	10 - Routes
Route Number	B.RT.02	AN (15)	4 - Features	10 - Routes
Route Type	B.RT.04	AN (1)	4 - Features	10 - Routes
Routine Permit Loads	B.LR.08	AN (1)	5 - Loads, Load Rating, and Posting	1 - Primary
Scour Condition Rating	B.C.11	AN (1)	7 - Bridge Condition	1 - Primary
Scour Plan of Action	B.AP.04	AN (1)	7 - Bridge Condition	1 - Primary
Scour Vulnerability	B.AP.03	AN (1)	7 - Bridge Condition	1 - Primary
Seismic Vulnerability	B.AP.05	AN (1)	7 - Bridge Condition	1 - Primary
Service Type	B.RT.05	AN (1)	4 - Features	10 - Routes
Sidehill Bridge	B.G.14	AN (1)	3 - Bridge Geometry	1 - Primary
Skew	B.G.11	N (2,0)	3 - Bridge Geometry	1 - Primary
Span Configuration Designation (many-to-one)	B.SP.01	AN (3)	2 - Bridge Material and Type	3 - Span Sets
Span Continuity	B.SP.05	AN (1)	2 - Bridge Material and Type	3 - Span Sets
Span Material	B.SP.04	AN (3)	2 - Bridge Material and Type	3 - Span Sets
Span Protective System	B.SP.07	AN (3)	2 - Bridge Material and Type	3 - Span Sets
Span Type	B.SP.06	AN (3)	2 - Bridge Material and Type	3 - Span Sets
State Code	B.L.01	N (2,0)	1 - Bridge Identification	1 - Primary
STRAHNET Designation	B.H.05	AN (1)	4 - Features	2 - Features
Substructure Condition Rating	B.C.03	AN (1)	7 - Bridge Condition	1 - Primary
Substructure Configuration Designation(many-to-one)	B.SB.01	AN (3)	2 - Bridge Material and Type	4 - Substructure Sets
Substructure Material	B.SB.03	AN (2)	2 - Bridge Material and Type	4 - Substructure Sets
Substructure Navigation Protection	B.N.06	AN (1)	4 - Features	2 - Features
Substructure Protective System	B.SB.05	AN (2)	2 - Bridge Material and Type	4 - Substructure Sets
Substructure Type	B.SB.04	AN (3)	2 - Bridge Material and Type	4 - Substructure Sets
Superstructure Condition Rating	B.C.02	AN (1)	7 - Bridge Condition	1 - Primary
Toll	B.CL.05	AN (1)	1 - Bridge Identification	1 - Primary
Total Bridge Length	B.G.02	N (7,1)	3 - Bridge Geometry	1 - Primary
Transitions	B.RH.02	AN (4)	2 - Bridge Material and Type	1 - Primary
Underwater Inspection Condition	B.C.15	AN (1)	7 - Bridge Condition	1 - Primary
Underwater Inspection Required	B.IR.03	AN (1)	6 - Inspections	1 - Primary
Urban Code	B.H.02	AN (5)	4 - Features	2 - Features
Wearing Surface	B.SP.10	AN (3)	2 - Bridge Material and Type	3 - Span Sets
Work Performed	B.W.03	AN (120)	7 - Bridge Condition	9 - Work
Year Built	B.W.01	N (4,0)	7 - Bridge Condition	1 - Primary
Year of Annual Average Daily Traffic	B.H.11	N (4,0)	4 - Features	2 - Features
Year Work Performed (many -to-one)	B.W.02	N (4,0)	7 - Bridge Condition	9 - Work

APPENDIX C: COMPONENT CONDITION RATING GUIDANCE

The following provides defect severity guidance that can be used in combination with the various condition rating code definition tables, in Subsection 7.1 – Component Condition Ratings, to determine the appropriate condition rating codes.

Table 46. All Materials - defect severity guidance for component condition ratings.

Defect	Minor	Moderate
Distortion	Distortion that has been mitigated or does not require mitigation.	Distortion that requires mitigation but has not been addressed.
Settlement	Exists within tolerable limits or arrested with no observed structural distress.	Exceeds tolerable limits.
Scour	Exists within tolerable limits established for the bridge.	Exceeds tolerable limits, but is less than the critical limits established for the bridge.

The Settlement defect applies to substructure components, pipes, and other components that may be directly affected by settlement. Superstructure and deck components that indirectly show the effects of settlement are evaluated by the resulting defects. Tolerable settlement can be considered as uniform or differential settlement that is not causing other bridge defects or increased impact on the bridge.

The critical limit for scour is the scour depth at which the bridge becomes unstable.

Table 47. Concrete - defect severity guidance for component condition ratings.

Defect	Minor	Moderate
Delamination, Spalling, Patched Area	Delamination, small spall, or patched area that is sound.	Large spall or patched area that is unsound or showing distress.
Exposed Rebar	Present without measurable section loss.	Present with measurable section loss.
Exposed Prestressing	Present without section loss.	Present with section loss.
Cracking	Unsealed medium width cracks or unsealed medium pattern (map) cracking.	Wide cracks or heavy pattern (map) cracking.
Abrasion, Wear, Scaling	Exposed coarse aggregate, but the aggregate remains secure in the concrete.	Coarse aggregate is loose or has popped out of the concrete matrix.
Efflorescence, Rust Staining	Surface white or leaching with little or no build-up. No rust staining present.	Rust staining or heavy build-up of efflorescence.

The concrete crack defect description definitions describe generalized distress, but the width, spacing, location, orientation, and structural or non-structural nature of the cracking should also be considered.

In general, cracks can be considered:

- Insignificant – crack width less than 0.004 inches (prestressed) or 0.012 inches (reinforced), or medium width cracks that have been sealed.
- Medium – crack width ranging from 0.004 – 0.009 inches (prestressed) or 0.012 to 0.05 inches (reinforced).
- Wide – crack width wider than 0.009 inches (prestressed) or 0.05 inches (reinforced).
- Medium pattern (map) – crack spacing of 1 ft. to 3 ft.
- Heavy pattern (map) – crack spacing less than 1 ft.

In general, spall size can be considered:

- Small spall - 1 inch or less deep or 6 inches or less in diameter.
- Large spall - greater than 1 inch deep or greater than 6 inches in diameter.

The rust staining defect applies only to reinforcing steel.

Table 48. Steel - defect severity guidance for component condition ratings.

Defect	Minor	Moderate
Corrosion	Freckled rust. Corrosion has initiated.	Section loss is evident.
Cracking	Crack that has been effectively arrested.	Crack that has not been arrested.
Connection	Loose fasteners, or pack rust without distortion. Connection is in place and functioning as intended.	Missing bolts, rivets, or fasteners; broken welds; or pack rust with distortion.

A well-formed patina on weathering steel is considered a protective coating and is not considered a defect.

The Connection defect applies to any members of a component that are fastened by bolts, rivets, or welds.

Table 49. Masonry - defect severity guidance for component condition ratings.

Defect	Minor	Moderate
Efflorescence, Rust Staining	Surface white or leaching with little or no build-up. No rust staining present.	Rust staining or heavy build-up of efflorescence.
Mortar Breakdown	Cracking or partial depth voids.	Full depth voids.
Splits, Spalls	Block or stone has split or spalled with no shifting.	Block or stone has split or spalled with shifting.
Patched Area	Sound patch.	Unsound patch.
Displacement	Block or stone has shifted slightly out of alignment.	Block or stone has shifted significantly out of alignment or is missing.

Table 50. Timber - defect severity guidance for component condition ratings.

Defect	Minor	Moderate
Cracking	Crack that has been effectively arrested.	Crack that has not been arrested.
Connection	Loose fasteners, or pack rust without distortion. Connection is in place and functioning as intended.	Missing bolts, rivets, or fasteners; broken welds; or pack rust with distortion.
Decay, Section Loss	Affects up to 10% of the member section.	Affects more than 10% of the member section.
Checks, Shakes	Penetrates 5% to 50% of the thickness of the member; not in a high stress zone.	Penetrates more than 50% of the member thickness and length equal to or greater than the member depth, or penetrates more than 5% of the member thickness in a high stress zone.
Splits, Delamination	Length less than the member depth or arrested with effective actions taken to mitigate.	Length equal to or greater than the member depth.
Abrasion, Wear	Affects up to 10% of the member section.	Affects more than 10% of the member section.

In general, checks and shakes can be considered insignificant when there is surface penetration less than 5% of the member thickness regardless of location.

Table 51. Other Materials - defect severity guidance for component condition ratings.

Defect	Minor	Moderate
Deterioration	Breakdown or deterioration has initiated.	Significant deterioration or breakdown.

For “Other Materials” the deterioration defect or other applicable defects shown within this table may apply. “Other Materials” include FRP, iron, aluminum, or materials other than concrete, steel, timber, or masonry. The “Other” category can also be considered when FRP is used as a repair material and is the predominant material type visible for inspection.

The following types of deterioration are common for FRP members:

- Blistering, discoloration, or wrinkling (Deterioration)
- Delaminations or voids (Delamination)
- Fiber exposure (Spall or Cracking)
- Scratches or cracks (Cracking)
- Creep or shrinkage (Distortion)

Table 52. Bearings - defect severity guidance for component condition ratings.

Defect	Minor	Moderate
Movement	Minor restriction.	Restricted.
Alignment	Lateral or vertical alignment that is inconsistent with temperature conditions, but is tolerable.	Approaching limits of lateral or vertical alignment for the bearing.
Bulging, Splitting, Tearing	Bulging less than 15% of bearing thickness.	Bulging 15% or more of bearing thickness. Splitting or tearing. Bearing’s surfaces are not parallel.
Loss of Bearing Area	Up to 10%	More than 10%.
Corrosion	Freckled rust. Corrosion has initiated.	Section loss is evident.
Connection	Loose fasteners, or pack rust without distortion. Connection is in place and functioning as intended.	Missing bolts, rivets, or fasteners; broken welds; or pack rust with distortion.

Table 53. Bridge Joints - defect severity guidance for component condition ratings.

Defect	Minor	Moderate	Major
Leakage	Minimal. Minor dripping through the joint.	Moderate. More than a drip and less than free flow of water.	Free flow of water through the joint.
Seal Adhesion	Adhered for more than 50% of the joint height.	Adhered 50% or less of joint height but still some adhesion.	Complete loss of adhesion.
Seal Cracking	Surface crack.	Crack that partially penetrates the seal.	Crack that fully penetrates the seal.
Seal Damage	Seal abrasion without punctures.	Punctured, torn, or partially pulled out.	Punctured completely through, pulled out, or missing.
Debris Impaction	Partially filled with hard-packed material, but still allowing free movement.	Completely filled; impacts joint movement.	Completely filled; prevents joint movement.
Adjacent Deck or Header	Edge delamination or spall 1” or less deep or 6” or less in diameter. No exposed rebar. Patched area that is sound.	Spall greater than 1” deep or greater than 6” diameter. Exposed rebar. Delamination or unsound patched area that makes the joint loose.	Spall, delamination, unsound patched area, or loose joint anchor that prevents the joint from functioning as intended.
Metal Deterioration or Damage	Freckled rust. Metal has no cracks or impact damage. Connection may be loose but functioning as intended.	Section loss, missing or broken fasteners, cracking of the metal, or impact damage. Joint still functioning.	Section loss, cracking of the metal, damage, or connection failure that prevents the joint from functioning as intended.

Table 54. Channel - defect severity guidance for component condition ratings.

Defect	Minor	Moderate	Major
Alignment	Flow angle of attack 15-30 degrees with respect to the bridge substructure, or 5-15 degrees with respect to wall piers.	Flow angle of attack 30-45 degrees with respect to the bridge substructure, or 15-30 degrees with respect to wall piers.	Flow angle of attack more than 45 degrees with respect to the bridge substructure, or more than 30 degrees with respect to wall piers.
Migration	Thalweg has moved from its baseline location, but movement has arrested or does not threaten the bridge or approach roadway.	Thalweg movement has not arrested and impacts embankment stability.	Thalweg movement has begun to undermine approach roadway.
Degradation	Exists within tolerable limits or has arrested.	Sloughing of banks, resulting in vertical embankments on both sides of the channel. Bridge is not yet impacted.	Sloughing of banks, resulting in vertical embankments on both sides of the channel. Bridge is impacted.
Aggradation	Exists within tolerable limits or has arrested.	Exceeds tolerable limits. Hydraulic opening is significantly blocked, increasing potential for overtopping or channel restriction.	Hydraulic opening is mostly blocked. May cause frequent overtopping or channel restriction.
Debris	Restricts channel slightly, or is prone to build-up.	Large deposits exist and restrict the channel, causing increased water velocities, redirecting stream flow, or eroding banks.	Hydraulic opening mostly blocked, significantly redirecting stream flow or impacting waterway capacity.
Bank Erosion/ Instability	Erosion/instability that does not impact the bridge or approach roadway.	Significant erosion/instability that is progressing toward the bridge or approach roadway.	Stability of the approach roadway embankment is impacted.