IDOT Bridge Data Guidance

Illinois Department of Transportation

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INTRODUCTION

CONTENT & INTENT

This Guide intends to address transition from Coding Guide to SNBI as well as new inventories in the future.

- SNBI data includes 154 Items.
- SNBI errata #1 is not in effect yet, therefore it is not adopted by IDOT yet, although some provisions are incorporated into Illinois policies as shown in individual items.
- New SNBI Items are explained here, including Coding Guide that translate partially.
- Old Coding Guide Items that translate cleanly to SNBI Items are thoroughly addressed in the SIPM Coding Manual, with some guidance presented here as well.

Colors can eventually be turned to black & white, but the color coding is helpful for visual learning/organizing.
Green text: existing bridges with existing data, including 1995 Coding Guide Items and IDOT Items that partially or wholly translate to SNBI Items.

- This guidance can be deleted after SNBI transition is completed and the Coding Guide is retired.

Blue text: guidance.

VARIOUS DATA ISSUES

Null Values

Some Items say do not report – leave blank.
Some Items require 0 or N when the item is not applicable – do not leave blank.

Some Items Need to be Measured or Re-Measured

Some data was not required to be collected for culverts until now:

- 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.H.16 Highway Maximum Usable Surface Width

Report the field measured NBIS bridge length when Item B.G.02 (Total Bridge Length) is less than 30 ft.

- B.G.01 NBIS Bridge Length

Dry bridges less than 30 feet high will need to be measured – they don't have stream cross-sections.

- B.G.13 Maximum Bridge Height

Temporary Codes

The FHWA crosswalk may transfer some data to Temporary Codes – these temporary codes need to be replaced with the correct code:

- B.SP.04 Span Material
- B.SP.06 Span Type
- B.SP.09 Deck Material and Type
- B.RH.01 Bridge Railings
- B.RH.02 Transitions
- B.H.04 National Highway Freight Network
- B.AP.03 Scour Vulnerability

Frequency of Collection of Items

SNBI defines the frequency of collection for each item as Calculated (4 items), Initial (113 items), or Every (37 items). The items labeled Every are summarized below and must be verified and/or updated at each inspection:

- Vertical Clearances: Highway and Railroad
- Horizontal Clearance:
  - Substructure Navigation
- Inspection Events: B.IE.01-12
- Condition Ratings: B.C.01-10 and 14-15
- Element Quantities: B.E.01-03
- Element Condition States: B.CS.01-04
- Appraisals:
  - B.AP.01 Approach Roadway Alignment
  - B.AP.02 Overtopping Likelihood

Data Entered by BBS Only

Load Rating data to be entered by Load Rating staff:

- B.LR.04 Load Rating Method
- B.LR.05 Inventory Load RF
- B.LR.06 Operating Load RF
- B.LR.07 Controlling Load RF
- B.LR.08 Routine Permit Loads
- B.EP.02 Legal Load Rating Factor

Scour data to be entered by Scour staff:

- B.AP.03 Scour Vulnerability
- B.AP.04 Scour Plan of Action

Computer Generated Data

Per the SIPM, these items do not need to be directly coded, they will be computer generated based on roadway data.

Location:

- B.L.03 Place Code
- B.L.04 Highway Agency District
- B.L.05 Latitude
- B.L.06 Longitude
- B.L.12 Metropolitan Planning Organization

Classification:

- B.CL.01 Owner
- B.CL.06 Emergency Evacuation Designation

Route:

- B.RT.02 Route Number
- B.RT.03 Route Direction
- B.RT.04 Route Type
- B.RT.05 Service Type

Highway:

- 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.09 AADT
- B.H.10 AADTT
- B.H.11 Year of AADT

REFERENCE MATERIALS

New IDOT Documents

Bridge Data Guide – this document provides guidance on 154 SNBI items.

Detailed Examples

- 056-0038: Widened 5-span WSPG over river
- 020-2010: RC Box Culvert to be re-inventoried as a frame bridge
- 016-2280: 3-span WSPG with a total of 9 features and 10 routes; East River Road over Kennedy Expwy
- 040-2009: Double barrel precast concrete frame culvert

Existing IDOT Documents

Structure Info & Procedure:	https://public.powerdms.com/IDOT/tree/documents/2013648
Structural Services Manual:	https://public.powerdms.com/IDOT/tree/documents/2084747
Bridge Manual, 2025:	https://public.powerdms.com/IDOT/documents/2504297
Element Manual:	https://public.powerdms.com/IDOT/documents/2083248

FHWA

NBIS home page:	https://www.fhwa.dot.gov/bridge/nbis.cfm
SNBI home page & Manual:	https://www.fhwa.dot.gov/bridge/snbi.cfm
BIRM (Inspection Manual):	https://www.fhwa.dot.gov/bridge/nbis/pubs/nhi23024.pdf
Evaluation Manual:	Manual for Bridge Evaluation (MBE)**
Element Manual:	Manual for Bridge Element Inspection (MBEI)**

** available for purchase (not a free download)

Mapping

IDOT mapping (IROADS):	https://webapps.dot.illinois.gov/iroads/
GOOGLE MAPS:	use to determine detour routes

THE CODING PROCESS

The best advice to learn SNBI is this: jump in and do a bridge, then do another one. It's overwhelming. But the coder will learn where to look for input for each item, how to navigate resources, what parts of plans are relevant, and what DOT preferences are for various items.

Each bridge is a mini research project. Review all the available documents and determine the coding to report. After coding a few bridges, the coder will establish a consistent process and develop habits to manage files. Coders should email questions about coding to DOT.BBS.BridgeMgmt@illinois.gov.

BRIDGE RESOURCES

Find bridge files in IHIS/ISIS>General>Files at https://ihis.dot.illinois.gov/structure-directory.
Review various resources for information, as suggested below, to determine codes for each SNBI Item.

PLANS: Review the plans first – highlight all the information needed to code. This will give a sense of the overall bridge. Look for design Plans, As-Built Plans, Shop Plans, Repair Plans.

- Cover or Quantities Sheet: epoxy rebar, pile type, beam type, construction revisions
- General Notes Sheet: protective systems on components, seismic vulnerability, design load and method, standard drawings, special provisions
- Plan/Profile/Elevation Sheet: span count and lengths, beam count and type, substructure and foundation type, railing type, skew, sidewalks, complex features
- Framing Plan: curved bridge or not, flared beams, irregular deck area
- Superstructure Sheets: NSTMs, fatigue details
- Navigation Permit plans: all of Section 4.5

INSPECTION DATA:

- Reports: Routine, NSTM, Underwater, Specials
    - Location, route, crossing, owner, lat/longs, overlay, RR name, posting status
    - inspection type, dates, names, equipment, work performed
    - condition ratings, element quantities and condition states
- Photos: stay-in-place forms, substructure type, railings, sidewalks, overhead obstructions to clearance, postings, approach alignment, overtopping
- Stream Cross-Section: maximum bridge height

SCOUR EVALUATION: foundation type, scour vulnerability, scour POA
LOAD RATING REPORT: design and rating methods and date, rating factors, rating vehicles
DESIGN CALCULATIONS: design load, design method, seismic assessment, scour assessment
OTHER HISTORICAL RECORDS: previous bridge number, crossing bridge number, border bridge agreements

SNBI ITEMS

ISIS has converted existing Coding Guide data to applicable SNBI Items using the FHWA data crosswalk and code mapping.

Items to Code

Code these sections on BBS-3200:

- Subsection 1.1 Identification
- Subsection 1.2 Location
- Subsection 1.3 Classification
- Subsection 2.1 Span Material & Type
- Subsection 2.2 Substructure Material & Type
- Subsection 2.3 Roadside Hardware
- Section 3 Bridge Geometry
- Subsection 4.1 Feature Identification
- Subsection 4.2 Routes
- Subsection 4.3 Highways
- Subsection 4.4 Railroads
- Subsection 4.5 Navigable Waterways
- Subsection 5.1 Loads and Load Rating*
- Subsection 5.2 Load Posting Status
- Subsection 5.3 Load Evaluation & Posting*
- Subsection 6.1 Inspection Requirements
- Subsection 7.4 Appraisal*
- Subsection 7.5 Work Events

Inspectors will code these at the next inspection:

- Subsection 6.2 Inspection Events B.IE
- Subsection 7.1 Component Cond Ratings B.C
- Subsection 7.2 Element Identification
- Subsection 7.3 Element Conditions B.CS

*BBS load raters and scour engineer will code these:

- Subsection 5.1 Loads and Load Rating
  - Items B.LR.03 thru 08
- *Subsection 5.3 Load Evaluation & Posting
  - Item B.EP.02 Legal Load RF
- *Subsection 7.4 Appraisal
  - Item B.AP.03 Scour Vulnerability
  - Item B.AP.04 Scour Plan of Action

Data Sets

SNBI categorizes items in data sets:

1. Primary – Identification, Location, Classification, Roadside Hardware, Geometry, Load Rating, Inspection Requirements, Component Condition Ratings, Appraisal, Year Built
2. Features – Feature Identification, Highways, Railroads, Navigable Waterways
3. Span Sets – Span Material and Type
4. Substructure Sets – Substructure Material and Type
5. Posting Status – Load Posting Status
6. Posting Evaluation – Load Evaluation and Posting
7. Inspections – Inspection Events
8. Elements
9. Work
10. Routes

Each item in the Primary data set has a single value.

Each item in the remaining data sets can have multiple values, and some must.

SNBI SECTION 1: BRIDGE IDENTIFICATION

Section 1: Bridge Identification
1.1 Identification
1.2 Location
1.3 Classification

SNBI SUBSECTION 1.1: IDENTIFICATION

1.1 Identification	
B.ID.01	Bridge Number
B.ID.02	Bridge Name
B.ID.03	Previous Bridge Number

B.ID.01 Bridge Number

Existing Bridges: Coding Guide Item 8 Structure Number

B.ID.02 Bridge Name

*** NEW ITEM ***

Existing Bridges: Illinois Item 7A Bridge Name

Use common English punctuation and capitalization.

SNBI allows 300 characters, prefers something descriptive be entered, but allows a blank entry.

B.ID.03 Previous Bridge Number

*** NEW ***

Existing Bridges: Illinois Item 8D Bridge Replaces Number

Report 0 if no previous number exists – do not leave blank.

SNBI SUBSECTION 1.2: LOCATION

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

B.L.01 State Code

Existing Bridges: Coding Guide Item 1 State Code

Illinois = 17

B.L.02 County Code

Existing Bridges: Coding Guide Item 3 County (Parish) Code

Illinois has 102 Counties, listed in SIPM for Item 3.

B.L.03 Place Code

Existing Bridges: Coding Guide Item 4 Place Code

Per SIPM, this item is computer generated based on roadway data.

B.L.04 Highway Agency District

Existing Bridges: Coding Guide Item 2 Highway District Agency

Illinois has 9 districts: 1 Schaumburg, 2 Dixon, 3 Ottawa, 4 Peoria, 5 Paris, 6 Springfield, 7 Effingham, 8 Collinsville, 9 Carbondale

District Map: https://public.powerdms.com/IDOT/tree/documents/2987828

Per SIPM, this item is computer generated based on roadway data.

B.L.05 Latitude

Existing Bridges: Coding Guide Item 16 Latitude

Per SIPM, this item is computer generated based on roadway data.

B.L.06 Longitude

Existing Bridges: Coding Guide Item 17 Longitude

Per SIPM, this item is computer generated based on roadway data.

B.L.07 Border Bridge Number

Existing Bridges: Coding Guide Item 99 Border Bridge Structure Number

See also Illinois Item 99A Border Bridge Remarks

Report N if not a border bridge – do not leave blank.

B.L.08 Border Bridge State or Country Code

Existing Bridges: Coding Guide Item 98A Neighboring State Code

Illinois is bordered by 5 states: 18 Indiana, 19 Iowa, 21 Kentucky, 29 Missouri, 55 Wisconsin

Do Not Report if not a border bridge.

B.L.09 Border Bridge Inspection Responsibility

Existing Bridges: some data exists but needs manipulation to transfer

- Item 98B Percent Responsibility
  - For Item 98B = 99 → report B.L.09 = 0 No Responsibility
  - For Item 98B = 00 → report B.L.09 = 2 Full Responsibility
  - For Item 98B = any other value → report B.L.09 = 1 Shared Responsibility

Do Not Report if not a border bridge.

B.L.10 Border Bridge Designated Lead State

Existing Bridges: some data exists but needs manipulation to transfer

- Item 98B Percent Responsibility

Do Not Report if not a border bridge.

B.L.11 Bridge Location

Existing Bridges: Coding Guide Item 9 Location

SNBI and IDOT allow 300 characters.

B.L.12 Metropolitan Planning Organization

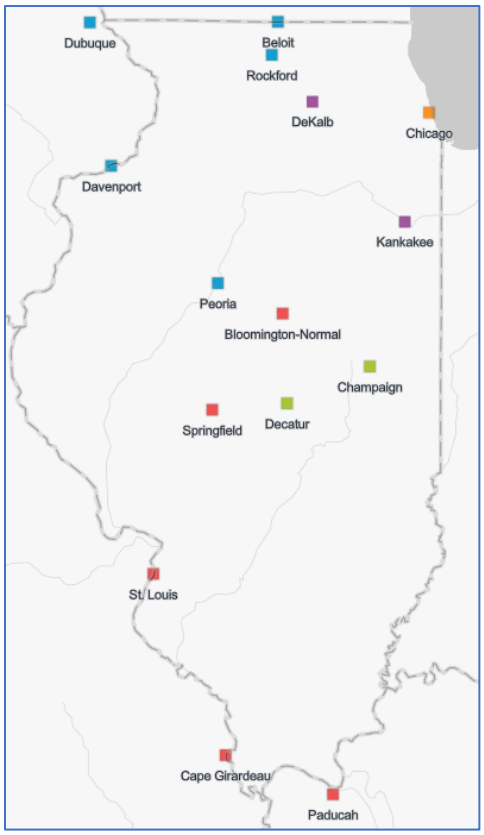
*** NEW ITEM ***

Report 0 if not located within an MPO area – do not leave blank.

Per SIPM, this item is computer generated based on roadway data.

Illinois has 15 MPOs: https://idot.maps.arcgis.com/apps/dashboards/71238415e2e449a6afa56b71550ac453

- Bloomington-Normal, IL – McLean County Regional Planning Commission, www.mcplan.org
- Chicago, IL – Chicago Metropolitan Agency for Planning, www.cmap.illinois.gov
- Decatur, IL – Decatur Urbanized Area Transportation Study, https://www.decaturil.gov/departments/development-services/decatur-urbanized-areatransportation-study-duats/
- DeKalb, IL – DeKalb-Sycamore Area Transportation Study, www.dsats.org
- Kankakee, IL – Kankakee Area Transportation Study, www.kats-mpo.org
- Peoria, IL – Tri-County Regional Planning Commission, www.tricountyrpc.org
- Rockford, IL – Region 1 Planning Council, www.r1planning.org
- Springfield, IL – Springfield-Sangamon County Regional Planning Commission
- Springfield Area Transportation Study, www.co.sangamon.il.us/departments/m-r/regional-planning-commission/programareas/transportation-planning
- Champaign, IL – Champaign-Urbana Urbanized Area Transportation Study, www.ccrpc.org/programs/transportation/



Border cities with overlap

- Beloit, WI – Stateline Area Transportation Study, https://www.beloitwi.gov/slats
- Dubuque, IA – Dubuque Metropolitan Area Transportation Study, www.eciatrans.org
- Davenport, IA – Bi-State Regional Commission, www.bistateonline.org
- Cape Girardeau, MO – Southeast Metropolitan Planning Organization, www.southeastmpo.org
- St. Louis, MO – East-West Gateway Council of Governments, www.ewgateway.org
- Paducah, KY – Paducah-McCracken Metropolitan Planning Organization, https://www.purchaseadd.org/local-government/paducah-mccracken-mpo/

SNBI SUBSECTION 1.3: CLASSIFICATION

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

B.CL.01 Owner

Existing Bridges: Coding Guide Item 22 Owner

Per SIPM, this item is computer generated based on Item B.CL.02.

B.CL.02 Maintenance Responsibility

Existing Bridges: Coding Guide Item 21 Maintenance Responsibility

B.CL.03 Federal or Tribal Land Access

Existing Bridges: Coding Guide Item 105 Federal Lands Highway

CG Item 105	SNBI Value	SNBI Description
0	N	Not applicable
1	BIA	Indian Tribal Government or Bureau of Indian Affairs
2	USFS	U.S. Forest Service
3	BLM	Bureau of Land Management
4	BIA|USFS	
5	BIA|BLM	
6	BLM|USFS	
9	BIA|BLM|USFS	
Additional SNBI Codes	NPS	National Park Service
	USACE	U.S. Army Corps of Engineers
	USBR	Bureau of Reclamation
	USFWS	U.S. Fish and Wildlife Service
	X	Other
Note: Multiple values can be stored for this item.		

Report N if not applicable – do not leave blank.

B.CL.04 Historic Significance

Existing Bridges: Coding Guide Item 37 Historical Significance
Report N if not applicable – do not leave blank.

Item 37=3 will give a temporary code in the initial SNBI transition – if documentation of the historical significance is found in the files, code accordingly, if not then report 5 POTENTIALLY.

The bridge would need some unique attribute to have the "potential" of significance. Judge by structure type: trusses and arches have potential, garden-variety beam bridges do not. Look for historical markers at the site.

7 NOT DETERMINED is conservative to code and should trigger an evaluation by the historical branch.

B.CL.05 Toll

Existing Bridges: Coding Guide Item 20 Toll
Report N if not applicable – do not leave blank.

B.CL.06 Emergency Evacuation Designation

*** NEW ITEM *** Illinois Item 6A Designated Critical Facility
Report N if not applicable – do not leave blank.
Per SIPM, this item is computer generated based on roadway data.

SNBI SECTION 2: BRIDGE MATERIAL AND TYPE

Section 2: Bridge Material and Type
2.1 Span Material and Type
2.2 Substructure Material and Type
2.3 Roadside Hardware

Use plan data and/or field evaluation to determine.

See the Bridge Inspector's Reference Manual (BIRM), (2022 NBIS) for guidance concerning superstructure and substructure types. Examples are given for many variations. The BIRM should be a standard go to for bridge inspectors to find in-depth explanation of bridges. The searchable pdf is an invaluable reference.

Extended Guidance for Cellular/Vaulted Abutment Reporting

Bridges with cellular/vaulted abutments are reported differently. For superstructure, it's an approach span. For substructure, that whole vaulted span is reported as one A10 substructure. And because that length of bridge is also considered a span for B.SP.02 and B.G.02, this violates the rule that X number of spans needs X+1 number of substructures.

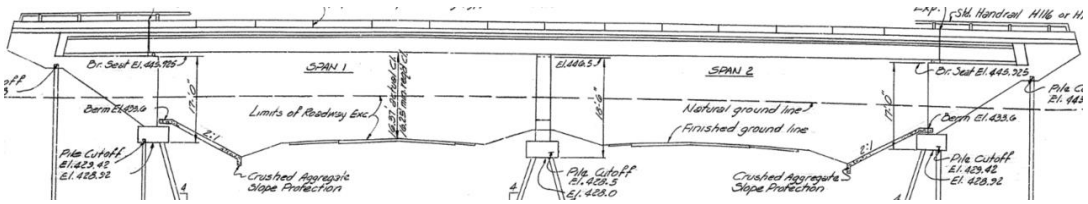
Cellular/Vaulted Abutments affect these Items and their codes:

- B.SP.01 Span Configuration Designation – vaulted spans are approach spans
- B.SP.02 Number of Spans – vaulted spans are counted in the span count
- B.SB.01 Substructure Configuration Designation – the whole vault is one substructure
- B.SB.02 Number of Substructure Units – the whole vault is one substructure
- B.SB.04 Substructure Type – A10 includes the stub abutment at the end of the bridge and the tall wall at the front face
- B.SB.06 Foundation Type – report what supports the front (taller) end
- B.G.01 NBIS Bridge Length – clear span is to the front face of the vault
- B.G.02 Total Bridge Length – vaulted spans are counted in the total bridge length
- B.G.03 and B.G.04 Maximum/Minimum Span Length – vaulted spans are considered for shortest/longest span length

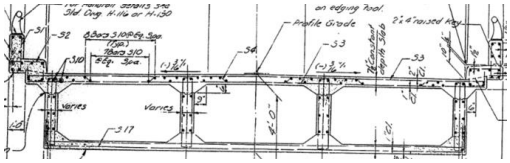
See the next page for an example.

Extended Guidance for Cellular/Vaulted Abutment Reporting (continued)

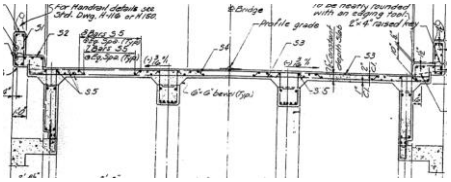
Example – this is a 4-span bridge. The main spans have continuous box beams. The approach spans have deck girders over cellular/vaulted abutments. In the vault, what looks like a 3-cell box is actually 4 tee beams. BUT the exterior beams have wall under them, so they're not counted as they don't "span" anything, so this approach span has 2 tee beams.



4-span Bridge



Main Span Cross-Section = 3 Box Beams



Approach Span Cross-Section = 4 Deck Girders

See IDOT Supplement to the AASHTO MBEI for more information on inventorying vaulted abutments.
Reporting for affected items for this example bridge:

2.1 Span Material and Type		
B.SP.01	M01	A01
B.SP.02	2	2
B.SP.03	3	2
B.SP.04	C01- Reinforced concrete- cast-in-place	C01- Reinforced concrete- cast-in-place
B.SP.05	2- Continuous	1- Simple or single span
B.SP.06	B02- Box girder/beam- multiple adjacent	G03- Girder/beam- tee-beam
2.2 Substructure Material and Type		
B.SB.01	A01	P01
B.SB.02	2	1
B.SB.03	C01- Reinforced concrete- cast-in-place	C01- Reinforced concrete- cast-in-place
B.SB.04	A10- Abutment- cellular/vaulted	P03- Pier- multiple column
B.SB.06	PX- Pile- other	PX- Pile- other
3 Geometry		
B.G.01	157.20	*two main spans*
B.G.02	198.20	*out-to-out of abutments, four spans*
B.G.03	80.00	*main spans*
B.G.04	16.80	*cellular abutment spans*

Extended Guidance for Culvert Reporting

Dry and/or At-Grade Culverts

The SNBI definition of a culvert includes "beneath an embankment," (yet we have at-grade culverts with no fill) and "hydraulically and structurally designed to convey water" (yet we have dry culverts).
Based on this definition, structures that are currently inventoried as culverts but have no fill and/or no flow are now considered bridges. IDOT defines "fill" to include asphalt overlay.

These Items are affected by this change:

- B.SP.01 Span Configuration Designation
  - Report M## for Main instead of C## for Culvert.
  - Report W## for Widening instead of V## for Culvert Extensions.
- B.E Element Identification and B.CS Element Condition
  - Change culvert elements 240-245 to Deck/Superstructure/Substructure elements.
- B.W.03 Work Performed
  - Use deck/super/sub codes rehabilitation and preservation codes.

Wet Culverts Under Fill

For culverts that ARE wet AND under fill, these items have nuances to note:

2.1 Span Material and Type

- B.SP.01 Span Configuration: C## or V##
- B.SP.03 Number of Beam Lines: 0 for pipes, 1 for frames, number of ribs for precast arch ribs
- B.SP.05 Span Continuity: 7 Buried
- B.SP.06 Span Type: F01 or F02 box culverts, P01 or P02 for pipe culverts, A01 or A03 for arch culverts
- B.SP.07 Span Protective System = precast concrete sometimes has AX for air entrainment
- B.SP.09 Deck Material and Type: 0-None
- Do Not Report:
  - B.SP.08 Deck Interaction
  - 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

2.2 Substructure Material and Type

- All 7 items: Do Not Report for pipe culverts.
- B.SB.01 Substructure Configuration Designation: do code for culverts
- B.SB.04 Substructure Type:
  - Arch culverts typically have A12 Abutment footing only and P08 Pier footing if multi-barrel.
  - RCBCs typically are coded A01 for end walls and P01 for interior walls.
- B.SB.06 Foundation Type, for a box culvert:
  - Report F01 on crushed stone, dirt, or UNKNOWN material
  - Report F02 only if it is KNOWN to be on rock

Extended Guidance for Culvert Reporting (continued)

2.3 Roadside Hardware

- B.RH.01 and B.RH.02 Bridge Railings and Railing Transitions: Even though it is a culvert, and the railing may not be attached to the structure, a code is still required.

3 Geometry

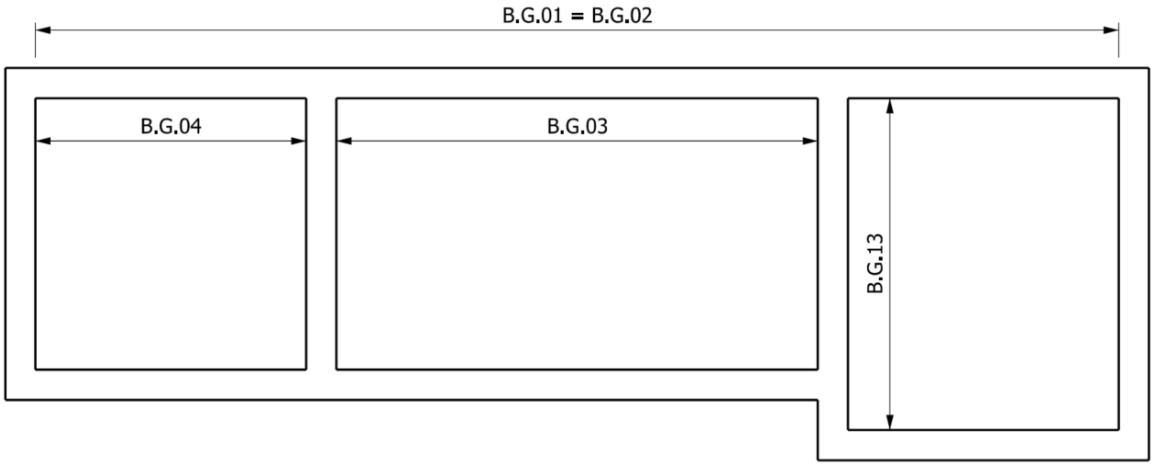
- B.G.01 thru 04 Bridge Lengths
  - Length(s) = barrel width(s) DIVIDED BY cos(skew)
  - Unlike bridges, do not include the end walls in the total length, only the clear. So clear=total.
  - Culvert spans are clear spans, as shown in the SNBI examples for B.G.03 and B.G.04.
- B.G.05 Bridge Width Out-to-Out
  - NEEDS TO BE MEASURED NEW, as this wasn't captured by old NBI Data for culverts.
  - Width = barrel length MULTIPLIED BY cos(skew)
  - Out-to-out length between headwalls; the minimum if headwalls are not parallel to each other.
  - This is a minimum measurement, as opposed to B.H.16 which is maximum.
- B.G.06 Bridge Width Curb-to-Curb
  - NEEDS TO BE MEASURED NEW, as this wasn't captured by old NBI Data for culverts.
  - Measure the sum of pavement widths, perpendicular to centerline, excluding medians. SNBI says it is "commonly" the same as B.G.09 Approach Roadway Width, but not necessarily.
- B.G.07 and B.G.08 Left and Right Curb or Sidewalk Width
  - NEEDS TO BE MEASURED NEW, as this wasn't captured by old NBI Data for culverts.
- B.G.13 Maximum Bridge Height
  - Commonly the barrel height, except closed spandrel arches measure from roadway surface.
  - For multiple barrels with different heights, report the tallest barrel height.

4.3 Highways

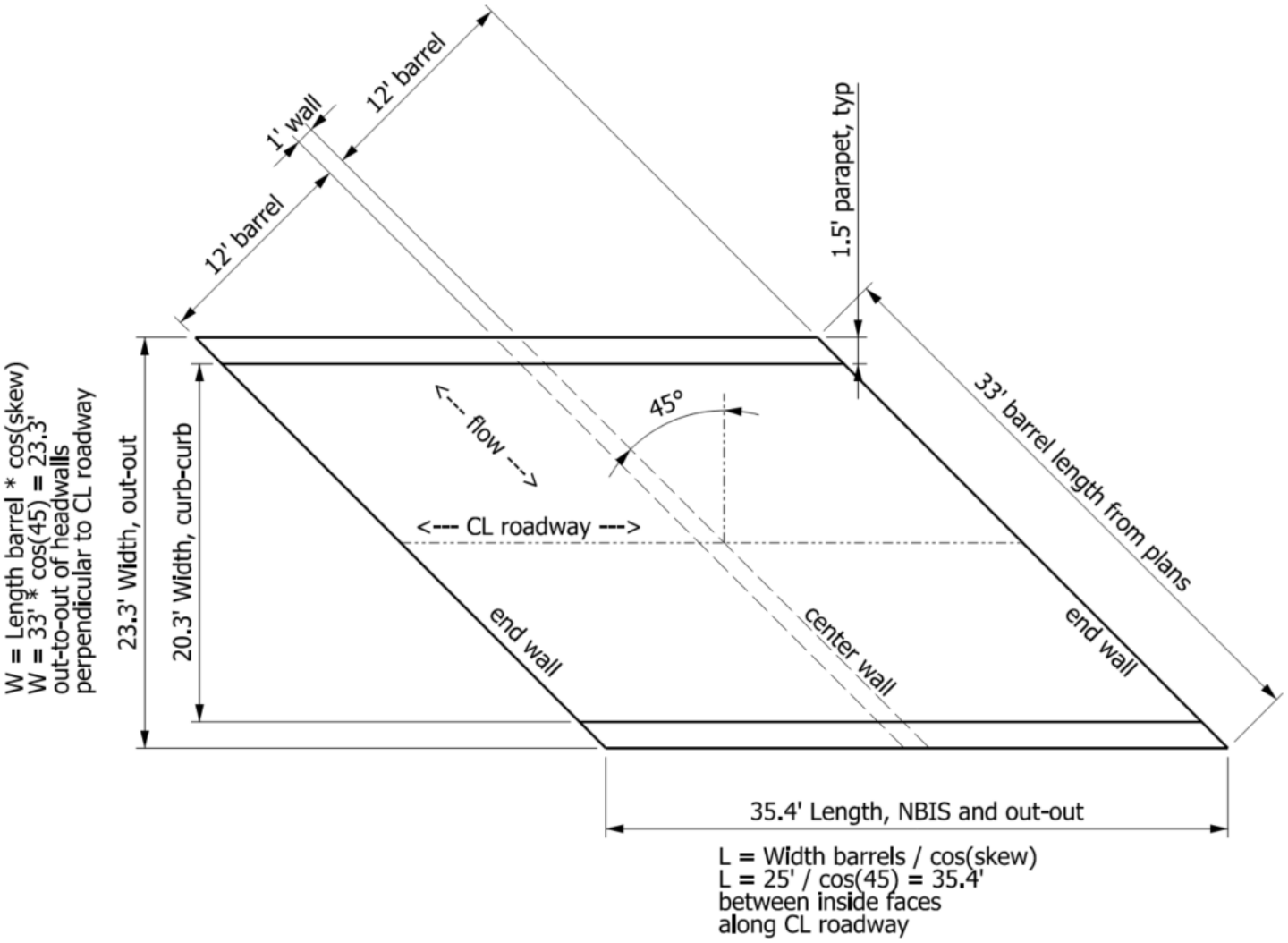
- B.H.16 Highway Maximum Usable Surface Width
  - NEEDS TO BE MEASURED NEW, as this wasn't captured by old NBI Data for culverts.
  - Measure the sum of pavement widths, perpendicular to centerline, excluding medians; usually same as Bridge Width Curb-to-Curb, unless divided highway.
  - This is a maximum measurement, as opposed to B.G.05 which is minimum.

Extended Guidance for Culvert Reporting (continued)

Measurements for a multi-barrel RCBC with variable cell widths and heights:
(as needed, adjust lengths for skew, adjust height for scour or aggradation)



Sample Calculations for a skewed culvert:



Example for a precast concrete culvert under fill:

2.1 Span Material and Type			
B.SP.01	Span Configuration Designation	C01	
B.SP.02	Number of Spans	2	
B.SP.03	Number of Beam Lines	1	
B.SP.04	Span Material	C02 Reinforced concrete precast	
B.SP.05	Span Continuity	7 Buried	
B.SP.06	Span Type	F01 Frame three-sided	
B.SP.07	Span Protective System	0 None**	
B.SP.08	Deck Interaction	(blank)	
B.SP.09	Deck Material and Type	0 None	
B.SP.10	Wearing Surface	(blank)	
B.SP.11	Deck Protective System	(blank)	
B.SP.12	Deck Reinforcing Protective System	(blank)	
B.SP.13	Deck Stay-In-Place Forms	(blank)	
2.2 Substructure Material and Type			
B.SB.01	Substructure Configuration Designation	A01	P01
B.SB.02	Number of Substructure Units	2	1
B.SB.03	Substructure Material	C01 RC CIP	C01 RC CIP
B.SB.04	Substructure Type	A12 Abutment footing only	P08 Pier footing only
B.SB.05	Substructure Protective System	0 None**	0 None**
B.SB.06	Foundation Type	F01 or F02	F01 or F02
B.SB.07	**Foundation Protective System**	0 None**	0 None**

** unless the plans call for particular admixtures in the concrete.

Because the superstructure is precast, it includes the walls. Therefore, the substructure is just the footings:

> Use code A12 or P08 when the superstructure rests only on a footing, grade beam, ~~or~~ thrust block, or pile or shaft cap with embedded piles or shafts that are not part of a bent.

And because substructure type is footing only, the substructure material is cast-in-place, not precast.

Extended Guidance for Protective Systems

Protective Systems for B.SP.07 SPAN, B.SP.11 DECK, B.SB.05 SUBSTRUCTURE, and B.SB.07 FOUNDATION.

Admixtures: Span, Deck, Substructure, Foundation

High Performance Concrete has microsilica for low-permeability – report A02 ADMIXTURE LOW PERMEABILITY.
Precast concrete sometimes has air entrainment – report AX ADMIXTURE OTHER.

Patina: Span, Deck, Substructure, Foundation

P01 PATINA UNCOATED WEATHERING STEEL – requires knowledge that the steel is actually weathering steel and not just unpainted steel. Look for evidence in design plans. Take photos of any marks on the structure.

Membranes: Span, Deck
Sacrificial: Span, Substructure, Foundation
Timber, Unknown, Other: Span, Deck, Substructure, Foundation

No guidance at this time.

Coatings: Span, Deck, Substructure, Foundation

C01 Coating Paint is not for concrete.
Concrete sealers don't last long – do not report if sealer application is older than its useful life.

- IDOT routinely applies sealant every 4 years to state structure decks – look for documentation in files.
- Curing compounds don't last – do not report.

Masonry Coating is aesthetic, not protective – do not report.
Anti-Graffiti Coating is aesthetic, not protective – do not report.
Coatings are continued on the next page.

Item 59B Last Paint Type (from SIP Manual) with corresponding SNBI Code for Protective System:

IDOT Item 59B	SIPM Description of Paint Type	SNBI Code	SNBI Description
A	Shop applied Basic Lead Silico Chromate or Red Lead primer/Maroon first field coat and interstate green* final coat	C01	Coating – paint
B	Shop applied Basic Lead Silico Chromate or Red Lead primer/Aluminum first and final field coats	C01	Coating – paint
C	Combination of A and B	C01	Coating – paint
D	Field applied Basic Lead Silico Chromate or Red Lead primer/Maroon and interstate green* 2nd and final coats	C01	Coating – paint
E	Field applied Basic Lead Silico Chromate or Red Lead primer/Aluminum 2nd and final coats	C01	Coating – paint
F	Combination of D and E	C01	Coating – paint
G	Shop applied Zinc Silicate and Field applied Vinyl paint system	C01	Coating – paint
H	Field applied Zinc Silicate and Vinyl paint system	C01	Coating – paint
I	Aluminum Epoxy Mastic Primer and Vinyl or Urethane overcoat system	C01	Coating – paint
J	Iron Oxide/Zinc Oxide Primer and Alkyd top coats	C01	Coating – paint
K	Iron Oxide/Zinc Oxide Primer and Aluminum Phenolic top coats	C01	Coating – paint
L	Miscellaneous Alkyd systems	C01	Coating – paint
M	Miscellaneous Epoxy systems	C01	Coating – paint
N	Miscellaneous Urethane primer systems	C01	Coating – paint
O	Base weathering Steel	P01	Patina - uncoated weathering steel
P	Other coating systems	CX	Coating - other
Q	Other protective systems	X	Other
R	No protection system	0	None
S	Shop applied Zinc Silicate and Field applied Acrylic paint system	C01	Coating – paint
T	Field applied Zinc Silicate and Acrylic paint system	C01	Coating – paint
U	Field applied Aluminum Epoxy and Acrylic	C01	Coating – paint
V	Galvanized	C03	Coating - hot dip galvanizing
W	Shop applied Metallizing & Field applied Polyurethane	C01	Coating – paint
X	Shop applied Zinc Silicate & Field applied Polyurethane	C01	Coating – paint
Y	Shop applied Organic Zinc and Field applied Epoxy & Polyurethane	C01	Coating – paint
Z	Field applied Organic Zinc, Epoxy & Polyurethane	C01	Coating – paint
AA	Field applied Moisture Cured Urethane	C01	Coating – paint
AB	Shop applied Organic Zinc, Epoxy, & Urethane	C01	Coating – paint
AC	Shop applied Metallizing (No top coat)	C04	metalizing/thermal spray
AD	Field applied Metallizing (No top coat)	C04	metalizing/thermal spray
AE	Shop applied Metallizing (Clear top coat)	C01	Coating – paint
AF	Shop applied Metallizing (Epoxy & Acrylic)	C01	Coating – paint
AG	Shop applied Metallizing (Epoxy & Urethane)	C01	Coating – paint

* Or any final color chosen by the district.

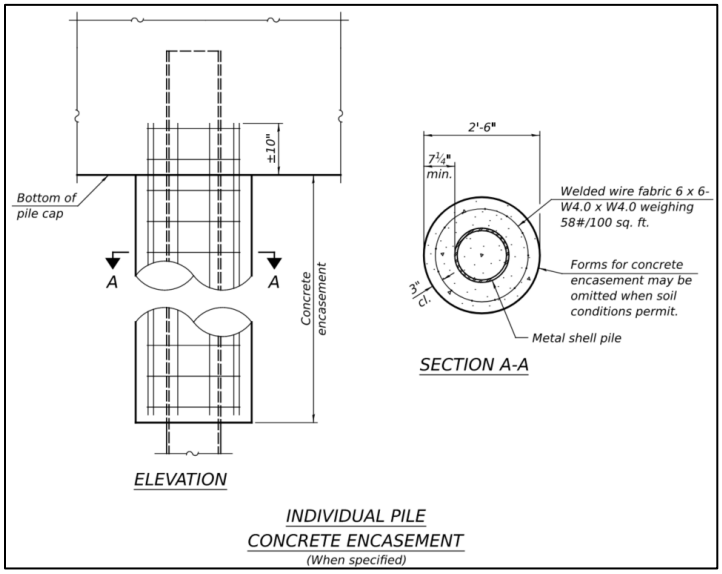
Encasements: Span, Substructure, Foundation

Most foundations do not have a protective system, but some do, specifically piles and drilled shafts:

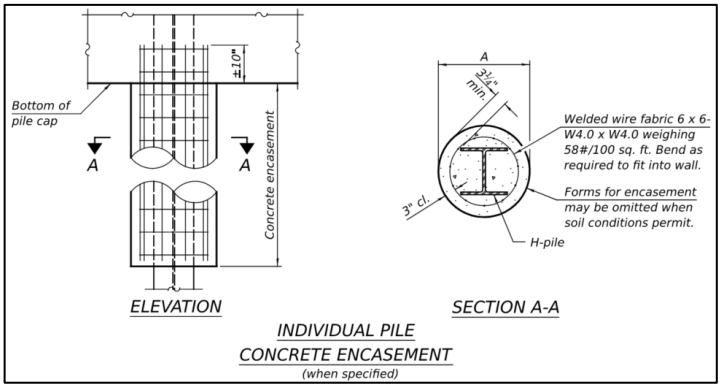
- CIP concrete piles or shafts might have a thin steel casing left in place – report EX ENCASEMENT OTHER.
- Steel H Piles or Metal Shell Piles might have concrete encasement – report E01 ENCASEMENT CONCRETE (see below).

When plans show details similar to these for a substructure unit, report E01 for B.SB.07 Foundation Protective System. When B.SB.04 is B03 Bent Pile, also report E01 for B.SB.05 Substructure Protective System.

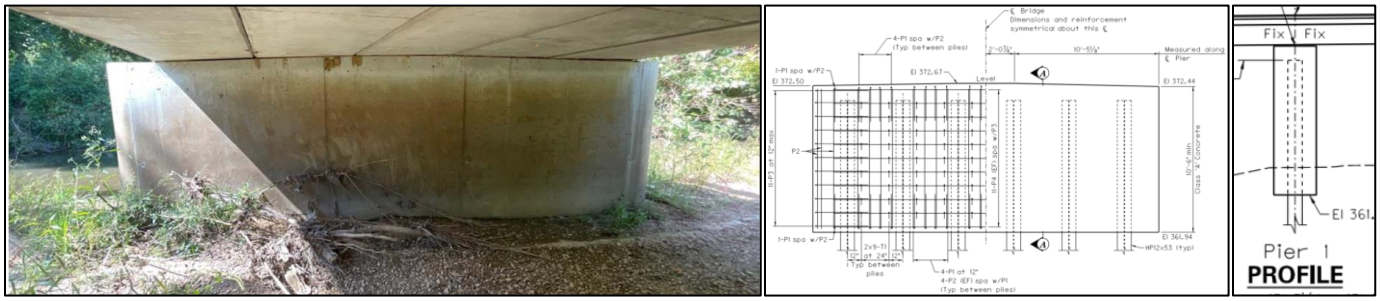
Cell/Model F-MS for Metal Shell Piles:



Cell/Model F-HP for Steel H Piles:



When piles are encased by a wall, even if the pile encasement detail is not shown for piling below the wall, report E01 for both B.SB.05 and B.SB.07. This pile bent example shows steel piles up to bridge seat, encased in concrete, with piles not exposed:



- B.SB.04 Substructure Type = B03 BENT PILE
- B.SB.05 Substructure Protective System = E01 ENCASEMENT CONCRETE
- B.SB.07 Foundation Protective System = E01 ENCASEMENT CONCRETE

SNBI SUBSECTION 2.1: SPAN MATERIAL AND TYPE

2.1 Span Material and Type	
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

Use plan data and/or field evaluation to determine.

B.SP.01 Span Configuration Designation

Existing Bridges: some data exists but needs manipulation to transfer

- Item 43 Structure Type Main
- Item 44 Structure Type Approach Spans

Assign label(s) per plans and/or field evaluation:

- If all 13 fields of Subsection 2.1 are not the same, report another B.SP.01 SPAN CONFIGURATION DESIGNATION for something different.

For Bridge Widening and Culvert Extensions, dissimilar construction means dissimilar design AND construction.
See above for Extended Guidance for Cellular/Vaulted Abutment Reporting and Culvert Reporting.

B.SP.02 Number of Spans

Existing Bridges: some data exists but needs manipulation to transfer

- Item 45 Number of Spans in Main Unit
- Item 46 Number of Approach Spans
- Illinois Item 62A Culvert Cells

Code main and approach spans separately.

B.SP.03 Number of Beam Lines

*** NEW ITEM ***

Without plans or good photos, calculate from quantities: Beam Quantity / Bridge Length = Number of Beams.
For culverts, report 0 for pipes, 1 for frames, number of ribs for precast arch ribs – do not leave blank.
Always check the most recent photos to verify any changes that may have occurred since original construction.

B.SP.04 Span Material

Existing Bridges: some data exists but needs manipulation to transfer

- Item 43A Main Material/Design
- Item 44A Approach Material/Design

Code main and approach spans separately.

B.SP.05 Span Continuity

Existing Bridges: some data exists but needs manipulation to transfer

- Item 43A Main Material/Design
- Item 44A Approach Material/Design

Check the load rating for continuity assumption and code same here.
Lack of continuity is demonstrated in photos/field by a discontinuity of the beam over a pier.
When in doubt, 1 SIMPLE OR SINGLE SPAN is conservative to code.

3 CONTINUOUS FOR LIVE LOAD ONLY: Prestressed I-beams are load rated simple for dead load and continuous for live load. See Section 3.4.1 of the Bridge Manual for current design policy.

7 BURIED does not include culverts at grade – those are most likely 6 FRAME.

- Illinois Item 62E Structure Fill Depth

B.SP.06 Span Type

Existing Bridges: some data exists but needs manipulation to transfer

- Item 43B Main Type
- Item 44B Approach Type

Code main and approach spans separately.
For precast segmental arch culverts (common brand name is Con-Span), report A03 ARCH CLOSED SPANDREL.
For Reinforced Concrete Box Culverts (RCBCs), report F01 or F02 FRAME.
For prefabricated arch culverts, report A01 or A03 ARCH.

B.SP.07 Span Protective System

*** NEW ITEM ***

- Illinois Item 59A Last Paint Date
- Illinois Item 59B Last Paint Type
- Illinois Item 59D Paint Remarks

See above for Extended Guidance for Protective Systems.

B.SP.08 Deck Interaction

*** NEW ITEM ***

The load rating should indicate whether the structure is composite or not.

DO NOT REPORT for buried structures.

SHORING: Default to unshored unless stated. Post-tensioned decks often require shored construction.

INTEGRAL/MONOLITHIC means there is no separate deck – the beam and deck are one entity – this includes RCDGs and side-by-side box beams without a slab.

NON-COMPOSITE means the deck and beam are not connected enough to share load, even though they may be connected for forming or construction needs.

COMPOSITE means the deck and beam are tied together. Shear stirrups on concrete beams and shear studs on steel beams provide composite action.

B.SP.09 Deck Material and Type

Existing Bridges: Coding Guide Item 107 Deck Structure Type

For buried culverts, unlike other fields for culverts, report 0 NONE instead of not reporting.

For adjacent prestressed box beams with no deck, report C03 CONCRETE PRESTRESSED for beam and for deck.

B.SP.10 Wearing Surface

Existing Bridges: Coding Guide Item 108A Type of Wearing Surface

Do Not Report for culvert under fill.

If the deck has an overlay of any kind, code accordingly. These are common types:

- Asphalt = B01 BITUMINOUS
- PCC = C04 CONCRETE LOW SLUMP
- Latex = C03 CONCRETE LATEX MODIFIED
- Epoxy = P01 POLYMER EPOXY
- Microsilica = C06 CONCRETE MICROSILICA
- Does Illinois have other common overlay types that have particular names?

With no overlay on the original concrete deck, B.SP.10 WEARING SURFACE depends on the thickness and how it was designed. From the SNBI Commentary: “Use code C01 when there is an additional sacrificial thickness cast concurrently with the structural deck or slab.

Concrete decks with greater than 7.5” thickness are designed with a sacrificial thickness of concrete at the top. So, an 8” concrete deck is designed as 7.5” thick for strength with the 0.5” added as deadload. Design assumes that over time, that top thickness will wear off from traffic/weather abrasion.

C01 CONCRETE MONOLITHIC means no overlay and a concrete deck 7.5” thick or greater – it has been designed with a sacrificial wearing surface. This includes the bare top flanges of RC deck girders and bare concrete decks atop beams or girders.

0 NONE means no overlay and a concrete deck less than 7.5” thick – it has been designed full-thickness with no wearing surface. This includes non-composite side-by-side prestressed box beams.

B.SP.11 Deck Protective System

Existing Bridges: Coding Guide Item 108B Type of Membrane; Illinois Item 512 Deck Waterproofing Type

See Extended Guidance for Protective Systems.

Do Not Report for culvert under fill.

B.SP.12 Deck Reinforcing Protective System

Existing Bridges: Coding Guide Item 108C Deck Protection

ONLY REPORTED FOR CONCRETE DECKS. Do not report for other deck material types.

Includes coatings on rebar (epoxy, galvanized), the rebar itself (stainless, FRP), and sacrificial cathodic systems.

Check the plans for evidence of epoxy coating – usually shown in quantities, general notes, or barbills.

Do Not Report for culvert under fill.

In 1976 (ABD 76.1) IDOT started requiring epoxy-coated bars in the top mats of steel only.

In 1981 (ABD 81.2) IDOT started requiring epoxy-coated bars in parapets.

In 1983 (ABD 83.5) IDOT started requiring epoxy-coating for all bars in the deck.

If the top and bottom mat have different protective systems, report the protective system for the top mat.

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

*** NEW ITEM ***

Check the photos. IDOT does not commonly use stay-in-place forms.

Do Not Report for culvert under fill.

SNBI SUBSECTION 2.2: SUBSTRUCTURE MATERIAL AND TYPE

2.2 Substructure Material and Type	
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

Use plan data and/or field evaluation to determine.
Do not report any substructure items for pipe culverts.

B.SB.01 Substructure Configuration Designation

*** NEW ITEM ***

Assign label(s) per plans and/or field evaluation:

- A01, A02, A03, etc. for abutments.
- P01, P02, P03, etc. for piers and bents.
- For Bridge Widening and Culvert Extensions, dissimilar construction means dissimilar design AND construction.
- Reinforced Concrete Box Culverts are typically A01 and P01.

If all 7 fields of Subsection 2.2 are not the same, report another B.SB.01 SUBSTRUCTURE CONFIGURATION DESIGNATION for something different.
See B.SP.01 for Extended Guidance for A10 Cellular/Vaulted Abutment and Culvert Reporting.

B.SB.02 Number of Substructure Units

*** NEW ITEM ***

Rule of thumb is that X number of spans needs X+1 number of substructure, with the exception of Cellular/Vaulted Abutment bridges, which will have X-1 number of substructures.

B.SB.03 Substructure Material

*** NEW ITEM *** Illinois Item 60A-B Substructure Material

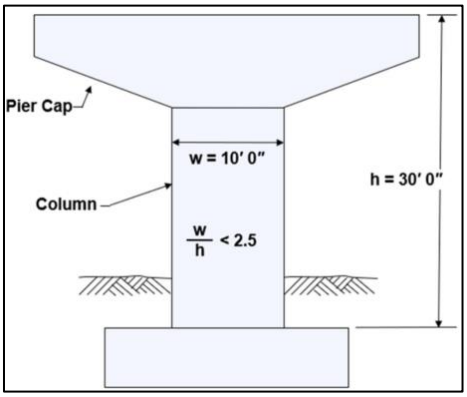
B.SB.04 Substructure Type

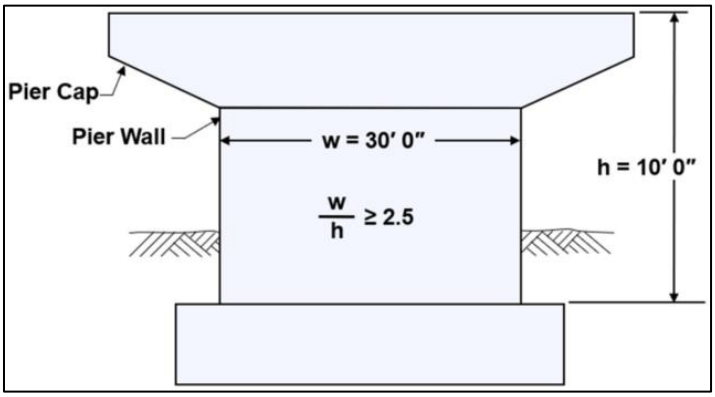
*** NEW ITEM ***

Guidance on abutment types:

- A02 STUB – typically low height with a sloped embankment up to it.
- A04 INTEGRAL – look for rebar or dowels that tie the cap and diaphragm together.
- A05 SEMI-INTEGRAL – diaphragm and backwall are poured together but not doweled into the cap.
- A06 GRAVTY – masonry abutments are often gravity type.
- A01 CANTILEVER – taller with a more pronounced footing toe and heel.
- A10 CELLULAR/VAULTED – see Extended Guidance.
- A12 FOOTING/CAP ONLY – CIP footing for prefabricated barrel.

Guidance on pier and bent types:

- PIERS have one footing BENTS have several footings or none.
  - See the foundation layout in the design or as-built plans
  - Without plans, choose Bent as conservative.
- For B02 BENT COLUMN WITH WEB WALL and P04 PIER MULTIPLE COLUMN WITH WEB WALL:
  - A crash-wall counts as a web-wall, per the SNBI example on Page 92.
- B03 BENT PILE: This code applies to both photos shown below, though they are 2 very different substructures. As shown in the second photo, steel piles that extend up through a concrete wall encasement might be mistaken for a regularly reinforced concrete wall if the piles are not visible. But if the primary load carrying member is the encased piles, the type is B03 BENT PILE, not pier wall.
  - 
  - 
- P08 FOOTING/CAP ONLY – CIP footing for prefabricated barrel.
- For a hammerhead pier, report P01 PIER WALL or P02 PIER SINGLE COLUMN. Use a ratio of width to height to determine (see IDOT Supplement to the AASHTO MBEI for examples):
  - W/H < 2.5 is a column W/H >= 2.5 is a wall
  - 

  - 

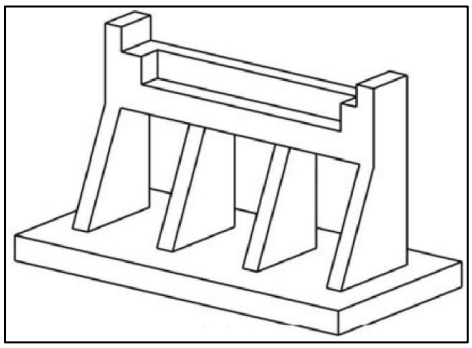
See the following pages for example of different substructure types.

Examples of Different Abutment Types:

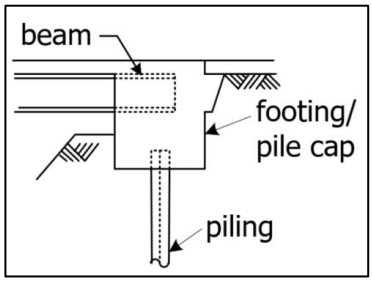
A01 Cantilever/wall:

A02 Stub:

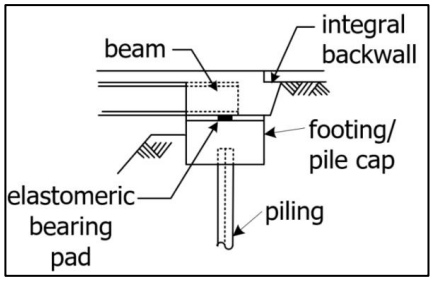
A03 Open/spill through:



A04 Integral:



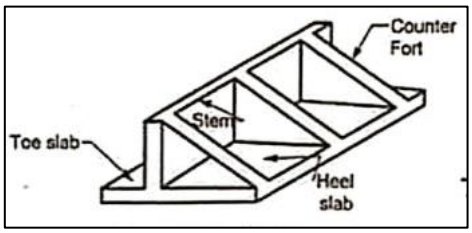
A05 Semi-integral:

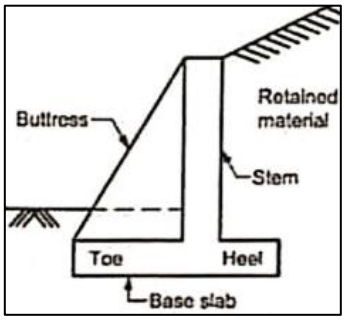


A06 Gravity:

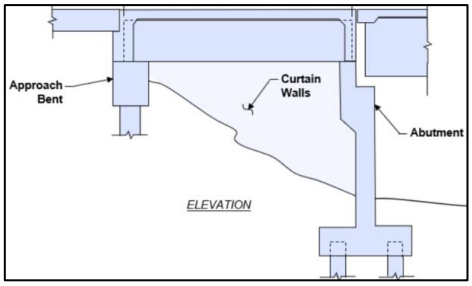
A08 Pile bent with lagging:

A07 Counterfort or buttressed

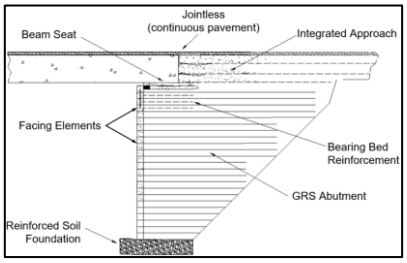




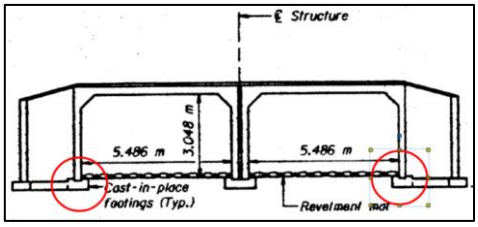
A10 Cellular/vaulted:



A11 Reinforced soil mass



A12 Footing or cap only:

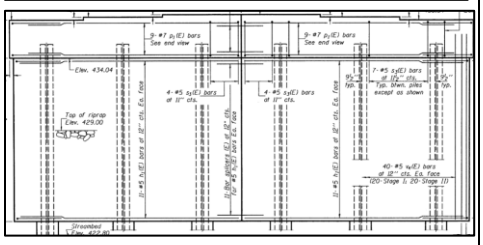


Examples of Different Bent and Pier Types:

B01 Bent column or open, or
P03 Pier multiple column:

B02 Bent column w/ webwall, or
P04 Pier multi column w/ webwall:

B03 Bent pile:

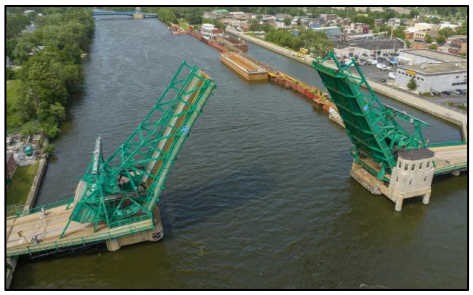


B04 Bent – straddle or c-shaped, or
P05 Pier – straddle or c-shaped

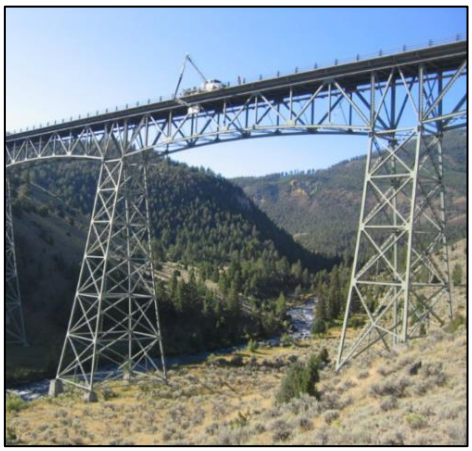
P01 Pier wall:

P02 Pier single column:

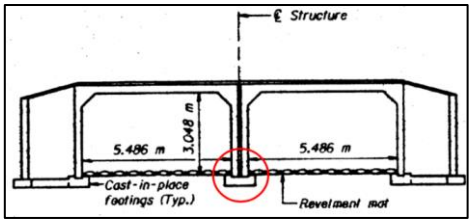
P06 Pier – movable bridge



P07 Pier tower:



P08 Pier – footing or cap only



B.SB.05 Substructure Protective System

*** NEW ITEM ***

Do not report for pipe culverts.

See Extended Guidance for Protective Systems.

B.SB.06 Foundation Type

*** NEW ITEM ***

Check the Scour Assessment to see what type was determined.

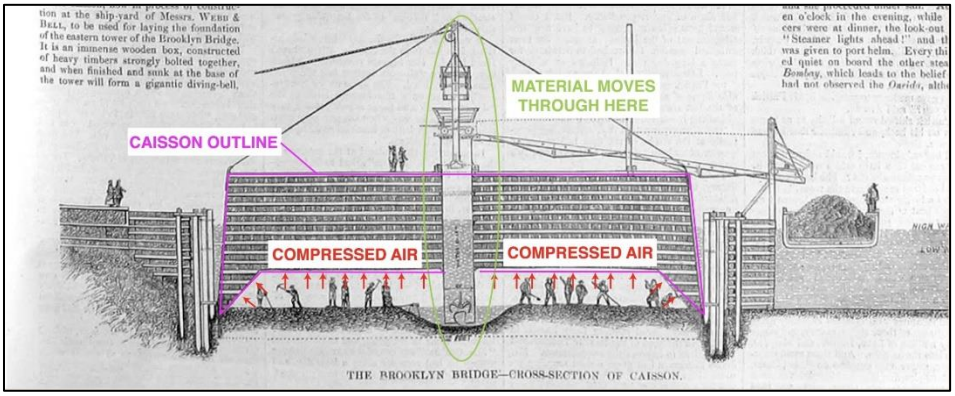
Footings:

- Default to F01 FOOTING NOT ON ROCK if foundation is unknown.
- Only code F02 FOOTING ON ROCK if rock is confirmed.

Piles:

- CIP concrete piles with thin steel casings might be mistaken for steel piles if the casing is visible. If the primary load carrying member is the concrete core, the type is P03 PILE CAST-IN-PLACE, not steel pile.
- PreCAST RC piles are not preSTRESSED concrete piles and do not have a code – report PX PILE OTHER.
- When multiple pile options are given, but the option chosen is not known – report PX PILE OTHER.

Drilled Shaft vs Caisson:

- The term “caisson” was used for different components in the past. What we now call drilled shafts were once called caissons: a drilled cylindrical hole filled with concrete, with or without permanent steel casing. But that is not the caisson defined by SNBI.
- SNBI defines a caisson as “a rectangular or cylindrical chamber for keeping water or soft ground from flowing into an excavation” and reports S03 Caisson for “footings sunk into position by excavation through or beneath the caisson structure.”
- Shallow caissons are open-topped and permanent and may look like cofferdams (which are temporary).
  - 
- Deep caissons are box-like structures sunk to the ground to allow construction within them.
  - 

B.SB.07 Foundation Protective System

*** NEW ITEM ***

Do not report for pipe culverts.

See Extended Guidance for Protective Systems.

SNBI SUBSECTION 2.3: ROADSIDE HARDWARE

2.3 Roadside Hardware	
B.RH.01	Bridge Railings
B.RH.02	Transitions

Existing Bridges: some data exists but more information is needed

- Item 36A Traffic Safety Feature, Bridge Railing
- Item 36B Traffic Safety Feature, Transitions

Rearrangement of the Coding Guide to SNBI translation shows the options a bit clearer:

<table>
<tr><th colspan="2">CODING GUIDE
36A Bridge Railings
36B Transitions</th><th colspan="2">SNBI
B.RH.01 Bridge Railings
B.RH.02 Transitions</th></tr>
<tr><td>N</td><td>Not applicable OR rail is not required</td><td>N</td><td>Not applicable: rail is not required.</td></tr>
<tr><td colspan="4">DOES NOT MEET A STANDARD</td></tr>
<tr><td rowspan="2">0</td><td rowspan="2">Rail does not meet standards OR
Rail is required but not present</td><td>0</td><td>Rail is required but not present.</td></tr>
<tr><td>I</td><td>Rail is not tested and does not meet standards.
OR
Rail does not meet standards due to overlay.
OR
No information is known about the test level.</td></tr>
<tr><td colspan="4">MEETS A STANDARD
SNBI standards are listed by increasing level of safety:
state standards are the lowest level, MASH standards are the highest level
T equals the Test Level, YY equals the published year</td></tr>
<tr><td rowspan="11">1</td><td rowspan="11">Inspected feature MEETS currently acceptable standards.</td><td>Code</td><td>Standard</td><td>Year Published</td></tr>
<tr><td>SYY</td><td>State standards, not tested</td><td>YY</td></tr>
<tr><td>AYY</td><td>AASHTO Std Specs, not tested</td><td>2007 latest</td></tr>
<tr><td>X</td><td>Other standards, tested</td><td></td></tr>
<tr><td>89T</td><td>AASHTO Guide Specs, TL 1 thru 3</td><td>1989</td></tr>
<tr><td>239T</td><td>NCHRP Report 239, TL 1 thru3</td><td>1981</td></tr>
<tr><td>230T</td><td>NCHRP Report 230, TL 1 thru 3</td><td>1991</td></tr>
<tr><td>350T</td><td>NCHRP Report 350, TL 1 thru 6</td><td>1993</td></tr>
<tr><td>M09T</td><td>AASHTO MASH, TL 1 thru 6</td><td>2009</td></tr>
<tr><td>M16T</td><td>AASHTO MASH, TL 1 thru 6</td><td>2016</td></tr>
</table>

For a bridge with more than one type of railing, report the lowest test level.

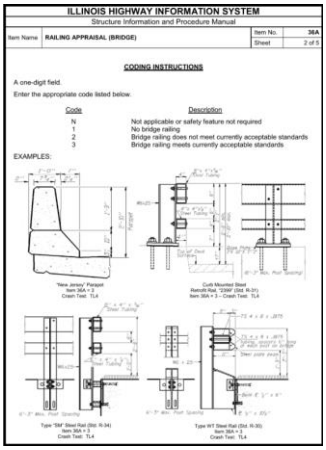
Quick codes are the first line of attack – work thru this list in this order:

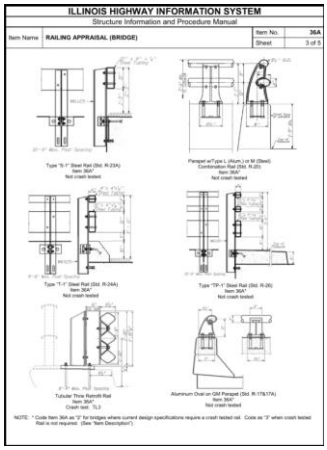
1. Report N if not required
    - Trailing one-way transition not needed.
    - Non-NHS bridge with ADT less than 1000 vehicles per day
    - Non-NHS bridge in urban area with curb-and-gutter and speed limit less than 40 mph
2. Report 0 (number not letter) if no railing is present but railing is required.
3. Report I (letter not number) if an overlay is applied to the deck/slab
    - the height no longer meets the original geometry requirements of the crash-tested rail
4. Report I if the rail is obviously not crash worthy – common on some local routes.
5. Report SYY if the rail is a state standard.
6. Report AYY if the bridge was designed per the AASHTO Standard Specs for Highway Bridges
    - last published in 2007, LFD method not LRFD
7. Investigate what standard is met – see below and APPENDIX A – RAIL GUIDANCE.
8. Report I if no information is known about the crash test level or agency approved standard.

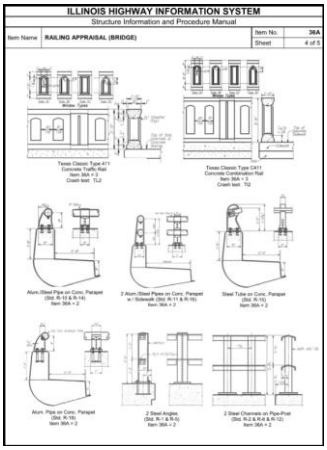
- Jumping from Step 7 (investigate) to Step 8 (giving up) is the big challenge.

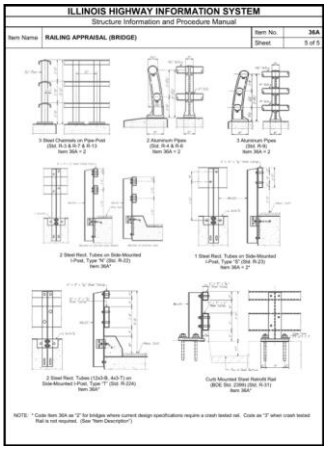
Investigation

The code has 3 parts to consider: Published Standard, Year of Publication, Test Level.
Plans or Design Calculations sometimes show the test level but not the year of the published specification.
The SIPM at Item No. 36A has railing schematics with test levels but not the publication standard:









Some publication standards can be ruled out by date, comparing the barrier construction date to the specification publication date. YY represents the year for the crash testing PUBLICATION, not the construction.

- 1931: first publication for AYY, AASHTO Standard Specs
- 1931 to 1981: SYY or AYY are the options
- 1981: Report 239
- 1989: AASHTO Guide Specs for Bridge Railings
- 1991: Report 230
- 1993: Report 350
- 2007: last publication for AYY, Section 2.7 Vehicular Railing
- 2009: MASH edition 1
- 2016: MASH edition 2

SNBI SECTION 3: BRIDGE GEOMETRY

Measurements vs Plan Dimensions:

Use plan dimensions when available. If field measurements vary appreciably, update the value, and note the difference in the element note.

SNBI allows plan dimensions for all of Section 3 except NBIS Length under 30'.
SNBI Section 3 Bridge Geometry Introduction:

- 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.

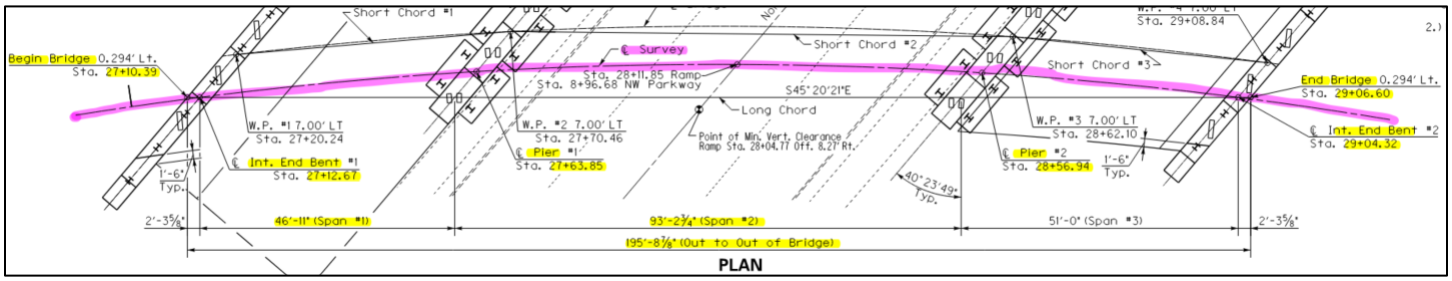
SNBI B.G.01 NBIS Bridge Length.

- Specification: Report the field measured NBIS bridge length when Item B.G.02 (Total Bridge Length) is less than 30 ft.
- Commentary: 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.

Curved Bridge Length Measurements:

B.G.01 thru 04 (clear, total, max and min spans) are measured along the roadway centerline. For curved bridges, determine this by subtracting stations along CL survey or CL bridge or by wheeling along the curved bridge deck. DO NOT USE THE CHORD LENGTHS.

For example:



B.G.02 Total = 2906.60 – 2710.39 = 196.2 ft – do not report the shown 195.7 ft given as "out-to-out of bridge."
B.G.01 Clear = 196.2 total – 2 * abutment thickness / cos(skew) = 196.2-2*3.5/cos(40.39694444) = 187.0 ft
For max and min, calculate all spans – for this bridge, Span 1 looks minimum but with skew and stationing, Span 3 is actually the shortest:
Span 1 = 2763.85-2712.67=51.2; Span 2 = 2856.94-2763.85=93.1; Span 3 = 2904.32-2856.94=47.4
B.G.03 Max Span = 93.1 ft – do not report the shown 93.2 ft given as Span 2 length.
B.G.04 Min Span = 47.4 ft for Span 3 – do not report the 46.9 ft given for Span 1.

Skewed Culvert Measurements:

See Extended Guidance for Culvert Reporting.

Section 3: Bridge Geometry	
B.G.01	NBIS Bridge Length
B.G.02	Total Bridge Length
B.G.03	Maximum Span Length
B.G.04	Minimum Span Length
B.G.05	Bridge Width Out-to-Out
B.G.06	Bridge Width Curb-to-Curb
B.G.07	Left Curb or Sidewalk Width
B.G.08	Right Curb or Sidewalk Width
B.G.09	Approach Roadway Width
B.G.10	Bridge Median
B.G.11	Skew
B.G.12	Curved Bridge
B.G.13	Maximum Bridge Height
B.G.14	Sidehill Bridge
B.G.15	Irregular Deck Area
B.G.16	Calculated Deck Area

B.G.01 NBIS Bridge Length

Existing bridges: IDOT Item 112 AASHTO Bridge Length has lengths less than 100 feet

Bridge length less than or equal to 30':

- MUST BE FIELD MEASURED per SNBI

Bridge length 30' to 99':

- IDOT Item 112 AASHTO Bridge Length
- may be estimated from plans or drawings
- may be estimated from the difference between Total Bridge Length and Maximum Span Length

Bridge length greater than 99':

- MUST BE FIELD MEASURED per IDOT, because IDOT Item 112 only reports 99.9 maximum

For measuring single spans, can measure with a laser.
For measuring multi-spans, can subtract the abutment thicknesses measured along skew from the measured out-to-out length.
For calculating, Clear = Total – 2 * Abutment Thickness / cos(skew)

See Extended Guidance for Culvert Reporting: with plans, Length = barrel width(s) DIVIDED BY cos(skew)

From 09/17/2024 FHWA Memo, Specifications for the National Bridge Inventory - Updates for Data Submittal Schema, Data Validation Logic, and NBIS Bridge Length:

> Converting metric units to imperial units and using common rounding techniques for Coding Guide Item 49 Structure Length results in bridges equal to 6.1 meters translating to 20.01 feet which would be rounded to 20.0 feet for reporting using the SNBI. The specification for SNBI Item B.G.01 NBIS Bridge

Length requires field measuring bridges when SNBI Item B.G.02 Total Bridge Length is less than 30 feet to confirm they meet the NBIS bridge definition. During the transition period (2026 and 2027), the FHWA recommends transitioning all bridges currently reported to the NBI as 6.1 meters to 20.1 feet until the first inspection in which the bridge length can be measured in the field and SNBI-formatted data can be collected. The FHWA is working on Errata #2 which will include additional language requiring that field measurements greater than 20.00 feet and less than 20.10 feet be rounded up to 20.1 feet to ensure all NBIS length bridges are reported to the NBI.

B.G.02 Total Bridge Length

Existing Bridges: Coding Guide Item 49 Structure Length

See Extended Guidance for Culvert Reporting: with plans, Length = barrel width(s) DIVIDED BY cos(skew)

B.G.03 Maximum Span Length

Existing Bridges: Coding Guide Item 48 Length of Maximum Span. Illinois Item 62B Culvert Cell Width

See Extended Guidance for Culvert Reporting: with plans, Length = barrel width(s) DIVIDED BY cos(skew)

Culvert spans are clear spans, as shown in the SNBI example.

B.G.04 Minimum Span Length

*** NEW ITEM ***

See SIPM guidance for Coding Guide Item 48 Length of Longest Span.

For single-span structures, B.G.03 Maximum = B.G.04 Minimum Span Length.

See Extended Guidance for Culvert Reporting: with plans, Length = barrel width(s) DIVIDED BY cos(skew)

Culvert spans are clear spans, as shown in the SNBI example.

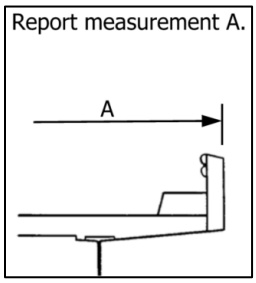
B.G.05 Bridge Width Out-to-Out

Existing Bridges: Coding Guide Item 52 Deck Width, Out-to-Out

NEED TO MEASURE ON CULVERTS, as this measurement has not been captured before for culverts.

See Extended Guidance for Culvert Reporting: with plans, Width = barrel length MULTIPLIED BY cos(skew)

SNBI allows measuring to the outside of the guardrail post – IDOT will measure to the edge of the concrete.



B.G.06 Bridge Width Curb-to-Curb

Existing Bridges: Coding Guide Item 51 Bridge Roadway Width, Curb-to-Curb

NEED TO MEASURE ON CULVERTS, as this measurement has not been captured before for culverts.

Note this is the minimum, as opposed to B.H.16 which is the maximum.

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

B.G.07 Left Curb or Sidewalk Width

B.G.08 Right Curb or Sidewalk Width

Existing Bridges: Coding Guide Item 50A Left and 50B Right Curb or Sidewalk Width

A curb/sidewalk engages a vehicular wheel; therefore, a wall is not a curb or sidewalk.

- A barrier or curb greater than 6" high may be considered non-mountable.

Include width of the curb bevel (often ~1.5") in the width, per examples.

NEED TO MEASURE ON CULVERTS, as this measurement has not been captured before for culverts.

B.G.09 Approach Roadway Width

Existing Bridges: Coding Guide Item 32 Approach Roadway Width

B.G.10 Bridge Median

Existing Bridges: Coding Guide Item 33 Bridge Median

B.G.11 Skew

Existing Bridges: Coding Guide Item 34 Skew

For bridges with multiple and different skew angles, the Coding Guide reported average, but SNBI now reports maximum.

B.G.12 Curved Bridge

*** NEW ITEM ***

Use plan data: note if the beams are straight in the framing plan.

Use field evaluation: sight along the beam lines and note if they are straight.

Report N if not curved – do not leave blank.

B.G.13 Maximum Bridge Height

*** NEW ITEM ***

Can be estimated if over 30 feet.

Frequency for collecting this item is I (Initial), therefore no updates are needed for future waterline changes.

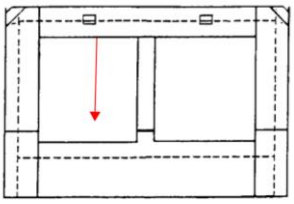
FHWA will use this item to gage the height of an inspection and will compare to equipment used, using this comparison for oversight of whether the bridge was sufficiently accessed for adequate inspection.

For wet bridges, obtain from the cross-section, noting the datum and subtracting the barrier height if needed.

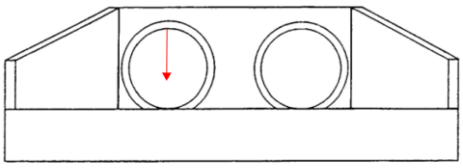
For dry bridges, field measure.

For buried structures without a deck:

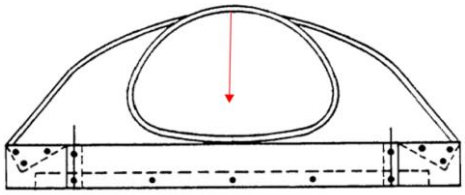
- For box culverts, measure down from the bottom of the top slab.
- For pipe and arch culverts, measure down from the apex of the curved barrel ceiling.
- Therefore, height will equal barrel height plus scour or minus aggradation.
- For multiple barrels with different heights, report the tallest barrel height.



End View
Cast-In-Place Concrete Multiple Box Culvert (219)
Precast Concrete Box Culverts (A19)



Precast Concrete Pipe Culverts (A19)
Metal Pipe Culverts
Steel (319)
Aluminum (919)



Corrugated Metal Plate Pipe Arch
Steel (319)
Aluminum (919)

B.G.14 Sidehill Bridge

*** NEW ITEM ***

Use plan data and/or field evaluation to determine.

Report N if not a sidehill bridge – do not leave blank.

B.G.15 Irregular Deck Area

*** NEW ITEM ***

If Item 35 Structure Flared = 1 Yes, may need to calculate the irregular deck area

Use plan data and or measurements to calculate.

B.G.16 Calculated Deck Area

Calculated by FHWA – Do Not Report.

Equals B.G.02 Total Bridge Length multiplied by B.G.05 Bridge Width Out-to-Out.

SNBI SECTION 4: FEATURES

Section 4: Features
4.1 Feature Identification
4.2 Routes
4.3 Highways
4.4 Railroads
4.5 Navigable Waterways

HIGHWAY FEATURES: Think of a FEATURE as pavement. Think of ROUTES as paths.

One undivided pavement is usually one FEATURE – one FEATURE can have more than one ROUTE (see B.RT.01).

- Each Route doesn't NEED its own Feature if it's all one pavement. But one pavement MAY be given more than one Feature.
- Decide how many ROUTES per FEATURE by considering what individual information needs to be differentiated for each feature, such as Clearances or Detours

Review these items to determine what HIGHWAY Features to report:

- Item 5A Record Type – Routes carried ON and UNDER
- Item 6A Feature Intersected
- Item 7 Facility Carried by Structure
- Item 42A Type of Service ON
- Item 42B Type of Service UNDER

Divided routes depend on whether the barrier is mountable and whether IRIS mapping has it split.

Ramps are TWO ROUTES (from and to). Ramps must be a separate FEATURE if they are separated from a mainline, but they may be included with the mainline pavement as all one FEATURE.

For Features carried above or below the inventory bridge ON ANOTHER BRIDGE, report B.H.18 Crossing Bridge Number for the inventory route, but do not report B.RT Routes or B.H Highways for the crossing bridge.

NON-HIGHWAY FEATURES

Review plans and photos to find NON-HIGHWAY Features to report.

Railroads: see Subsection 4.4.

Navigable Waterways: see Subsection 4.5.

Paths: a path (sidewalk, trail, bike lane, etc.) must be separated – a curb counts as separation, paint does not.

- A path should have approach paths to/from it – otherwise, it's just a wide curb, not a path.
- Multiple sidewalks (left and right, for example) may be lumped together as one feature – P01 Pathway.
- If there are also paths above or below the bridge, report P02, etc.

Urban Features:

- Multiple features of the same type (parking lots, buildings, etc.) may be listed individually (to delineate location or ownership as needed) or may be lumped into one feature per type

Do not include utilities or ancillary structures as features.

SPLITTING FEATURES, ROUTES, AND HIGHWAYS

Divided routes that are currently inventoried as two-way traffic on a single route need to be split into separate features, routes, and highways. This is necessary for permit routing. These items need to be split accordingly:

- B.H.08 Lanes on Highway
- B.H.09 Annual Average Daily Traffic
- B.H.10 Annual Average Daily Truck 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

See next page for an example of determining features and routes.

EXAMPLE OF DETERMINING FEATURES AND ROUTES:

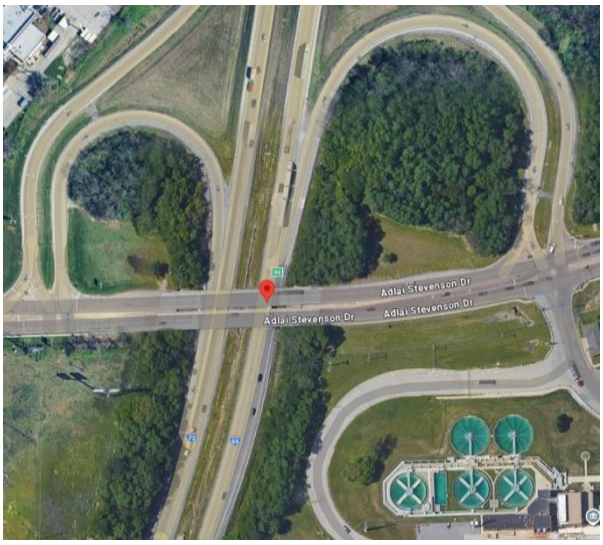
084-0083 carries WB Stevenson Drive over I-55, I-72, and US-36. (084-0082 carries EB.)
Maps: https://webapps.dot.illinois.gov/IROADS/?sn=0840083 & https://maps.app.goo.gl/h1QfiKTbLfphy2Ts7

H01 is always the feature carried.

- Stevenson Drive WB is an unnumbered route (B.RT.02=0).

H02 and H03:

- There are 2 pavements under the bridge. Each pavement has 3 lanes which carry 7 routes. The ramp lanes are separated by paint only, with no barrier.
- I-55, I-72, and US-36 are a combined route
  - Report 3 mainline routes (B.RT.05=1)
  - R01=55, R02=72, R03=36
- The exit/entrance ramp lanes extend under the bridge. A ramp must report the FROM and the TO separately:
  - Report 4 ramp routes (B.RT.05=7)
  - R04=Stevenson, R05=55, R06=72, R07=36



Route Carried:

Route Below, NB/EB:

SB/WB:

4.1 Feature Identification															
B.F.01	H01	H02							H03						
B.F.02	Carried	Below							Below						
B.F.03	Adlai Stevenson Drive WB| East Lake Shore Drive WB	I-55 NB|I-72 EB|US-36 EB| Ramp from I-55 NB/I-72 EB/US-36 EB to Stevenson Drive							I-55 SB|I-72 WB|US-36 WB| Ramp from Stevenson Drive to I-55 SB/I-72 WB/US-36 WB						
4.2 Routes															
B.F.01	H01	H02							H03						
B.RT.01	R01	R01	R02	R03	R04	R05	R06	R07	R01	R02	R03	R04	R05	R06	R07
B.RT.02	0	55	72	36	0	55	72	36	55	72	36	0	55	72	36
B.RT.03	WB	NB	EB	EB	EW	NB	EB	EB	SB	WB	WB	EW	SB	WB	WB
B.RT.04	X	1	1	2	X	1	1	1	1	1	2	X	1	1	1
B.RT.05	1 Mainline	1 Mainline			7 Ramp				1 Mainline			7 Ramp			

SNBI SUBSECTION 4.1: FEATURE IDENTIFICATION

4.1 Feature Identification	
B.F.01	Feature Type
B.F.02	Feature Location
B.F.03	Feature Name

B.F.01 Feature Type

Existing Bridges: some data exists but needs to be rearranged

- Item 5A Record Type – on and under routes – include each of those routes in a H## feature
- Item 42A Type of Service – ON the bridge
- Item 42B Type of Service – UNDER the bridge

Assign a separate designation for each feature: H##, R##, P##, W##, F##, B##, D##, X##.

Report the features CARRIED on the bridge before reporting any features ABOVE or BELOW.

- H01 will always be CARRIED.

B.F.02 Feature Location

Existing Bridges: some data exists but needs manipulation to transfer

- Item 42A Type of Service – ON the bridge
- Item 42B Type of Service – UNDER the bridge

The 5 options are Carried On Bridge, Above Bridge, Below Bridge, Top Level, and Lower Level.

B.F.03 Feature Name

Existing Bridges: some data exists but needs manipulation to transfer

- Item 6 Features Intersected
- Item 7 Facility Carried by Structure
- Item 5B Route Signing Prefix (SIPM “Inventory Route Kind”, “Kind” on ISIS Marked Route screen)

Standard Nomenclature for naming features:

- SNBI and ISIS both allow up to 300 characters.
- Avoid abbreviations in feature names, other than NB, SB, EB, WB. Spell out Road, Street, etc.
- If the route has a route prefix and number, report it first – include the dash between:
    - Item 5B = 1, Interstates: I-##
    - Item 5B = 2, US Routes: US-##
    - Item 5B = 3, State Routes: IL-##
    - Item 5B = 4, County Highway: CH-##
    - Item 5B = 4, Township Road: TR-##
    - Item 5B = 5 City Streets or 8 Other: no route prefix or route number
    - Item 5B = 6, Federal Lands Road: (only 24 bridges)
    - Item 5B = 7, State Lands Road: not used

Continued on next page.

Standard Nomenclature for naming features (continued):

- Report multiple names using the pipe delimiter – but do not put spaces around the |, as shown in examples. For example:
  - IL-83|Busse Road
  - CH-23|Cabery Road
  - TR-248|East 16th Street
- Highways: use NB, SB, EB, WB when applicable. For example:
  - I-55 NB
  - I-294 EB|Tri-State Tollway
- Ramps: Convention is "Ramp from route directional to route directional." For example:
  - Ramp from IL-20 EB to I-355 NB
- Railroads: Convention is "CODE|Railroad Name." For example:
  - CTA|Chicago Transit Authority
- Sidewalks: Convention is "Sidewalk on ___ side of bridge." For example,
  - Sidewalk on South side of bridge
  - Sidewalks on both sides of bridge

SNBI SUBSECTION 4.2: ROUTES

4.2 Routes	
for each corresponding B.F.01 (H## only)	
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

These items may be computer generated in the future using roadway data.

B.RT.01 Route Designation

Existing Bridges: some data exists but needs manipulation to transfer

- Item 5A Record Type – on and under routes – include each of those routes in an R## route

Assign a separate designation for each route as R## for each B.F.01 Feature H##.
Begin with R01 assigned to H01. Each B.F.01 Highway H## may have several B.RT.01 Routes R##.
See example in the Extended Guidance for Features and Routes at the beginning of Section 4.
Features carried above or below the inventory bridge ON ANOTHER BRIDGE – do not report B.RT Routes or B.H Highways for the crossing bridge – do report B.H.18 with the crossing bridge number for the inventory route.

B.RT.02 Route Number

Existing Bridges: Coding Guide Items 5D Route Number and 5E Directional Suffix

B.RT.03 Route Direction

Existing Bridges: some data exists but needs manipulation to transfer

- Item 102 Direction – indicates 1-way, 2-way, 1-Lane-2-Way, and N/A

Generally, odd numbered Township Roads have an east-west orientation; even numbers are north-south.
Municipal Street numbers under 5,000 have an east-west orientation, 5,000 and up are north-south.

B.RT.04 Route Type

Existing Bridges: Coding Guide Item 5B Route Signing Prefix
For Item 5B = 5 City Streets or 8 Other, report 0 for route number.

B.RT.05 Service Type

Existing Bridges: Coding Guide Item 5C Designated Level of Service

SNBI SUBSECTION 4.3: HIGHWAYS

4.3 Highways	
for each corresponding B.F.01 (H## only)	
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

Features carried above or below the inventory bridge ON ANOTHER BRIDGE – do not report B.RT Routes or B.H Highways for the crossing bridge – do report B.H.18 with the crossing bridge number for the inventory route.

B.H.01 Functional Classification

Existing Bridges: Coding Guide Item 26 Functional Classification of Inventory Route

Per SIPM, this item is computer generated based on roadway data.

B.H.02 Urban Code

Existing Bridges: some data exists but needs manipulation to transfer

Per SIPM, this item is computer generated based on roadway data.

B.H.03 NHS Designation

Existing Bridges: Coding Guide Item 104 Highway System of the Inventory Route

Report N for Non-NHS – do not leave blank.

Per SIPM, this item is computer generated based on roadway data.

B.H.04 National Highway Freight Network

Existing Bridges: some data exists but needs manipulation to transfer

Per SIPM, this item is computer generated based on roadway data.

B.H.05 STRAHNET Designation

Existing Bridges: Coding Guide Item 100 STRAHNET Highway Designation

Report N for Non-STRAHNET– do not leave blank.

Per SIPM, this item is computer generated based on roadway data.

B.H.06 LRS Route ID

Existing Bridges: Coding Guide Item 13A/13B LRS Inventory Route, Subroute Number

Report N if not assigned– do not leave blank.

Per SIPM, this item is computer generated based on roadway data?

B.H.07 LRS Mile Point

Existing Bridges: Coding Guide Item 11 Milepoint

Per SIPM, this item is computer generated based on roadway data.

B.H.08 Lanes on Highway

Existing Bridges: Coding Guide Item 28A Lanes on Structure

Per SIPM, this item is computer generated based on roadway data.

B.H.09 Annual Average Daily Traffic

Existing Bridges: Coding Guide Item 29 Average Daily Traffic

Per SIPM, this item is computer generated based on roadway data.

B.H.10 Annual Average Daily Truck Traffic

Existing Bridges: Coding Guide Item 109 Average Daily Truck Traffic

Per SIPM, this item is computer generated based on roadway data.

B.H.11 Year of Annual Average Daily Traffic

Existing Bridges: Coding Guide Item 30 Year of Average Daily Traffic

Per SIPM, this item is computer generated based on roadway data.

B.H.12 Highway Maximum Usable Vertical Clearance

Existing Bridges: Coding Guide Item 10 Inventory Route, Minimum Vertical Clearance

Field measure. Do not enter from plan dimensions.

B.H.13 Highway Minimum Vertical Clearance

Existing Bridges: Coding Guide Item 53/54A/54B Minimum Vertical Clearance Over Bridge Roadway / Reference Feature / Minimum Vertical Underclearance

Field measure. Do not enter from plan dimensions.

Include traffic signals including the signal heads, rigid support structure, and span wire as applicable. This applies only to traffic signals that pass over or under a bridge. The information is sometimes used for preliminary military routing and planning helping to identify locations where rerouting or coordination with the owner are required.

B.H.14 Highway Minimum Horizontal Clearance, Left

Existing Bridges: Coding Guide Item 55A/56 Reference Feature / Minimum Lateral Underclearance on Left
Field measure. Do not enter from plan dimensions.
Do Not Report for Highway Features carried on the bridge – this includes all buried structures.
Report 0 when the highway under is a two-way highway that is not divided at the bridge.

B.H.15 Highway Minimum Horizontal Clearance, Right

Existing Bridges: Coding Guide Item 55A/55B Reference Feature / Minimum Lateral Underclearance on Right
Field measure. Do not enter from plan dimensions.
Do Not Report for Highway Features carried on the bridge – this includes all buried structures.

B.H.16 Highway Maximum Usable Surface Width

Existing Bridges: Coding Guide Item 47 Inventory Route, Total Horizontal Clearance
NEED TO MEASURE ON CULVERTS, as this measurement has not been captured before for culverts.
This is the maximum, as opposed to B.G.06 which is the minimum.

B.H.17 Bypass Detour Length

Existing Bridges: Coding Guide Item 19 Bypass Detour Length
Data likely exists only for the on route. Under routes need a value too.
Quick Codes:

- Diamond Interchange = 0 for over route but not for under route
- Parallel bridges = 1 for over route but not for under route
- No Detour = 999

Consider functional class when determining which routes to detour onto. For instance, do not detour interstate traffic onto local routes and vice versa. Don't send heavy truck traffic thru the middle of a town, and don't send a farmer hauling hay onto the interstate, even if it's the shortest detour.

See APPENDIX B – DETOUR DETERMINATION for B.H.17 for a detailed example.

B.H.18 Crossing Bridge Number

*** NEW ITEM *** Illinois Item 8B Multi-Level Structure Number
Do Not Report when none exist.
Do Not Report when the crossing bridge is not reportable to NBI.

SNBI SUBSECTION 4.4: RAILROADS

4.4 Railroads	
B.RR.01	Railroad Service Type
B.RR.02	Railroad Minimum Vertical Clearance
B.RR.03	Railroad Minimum Horizontal Offset

B.RR.01 Railroad Service Type

*** NEW ITEM *** Illinois Item 8C Railroad Crossing Number
Do Not Report when no Railroad Feature is reported.

This site gives an overview of rail systems in Illinois:
https://idot.illinois.gov/transportation-system/network-overview/rail-system.html

This map shows railroad services in Illinois, with rail names:
https://idot.illinois.gov/content/dam/soi/en/web/idot/documents/transportation-system/maps---charts/railroad-maps/ilrailroadmap.pdf

This map shows grade crossings: https://icc.illinois.gov/rail-safety/grade-crossing-map

AMTRAK = M MULTIPLE SERVICES NOT ELECTRIFIED
CTA = PE PASSENGER ELECTRIFIED
METRA (Electric District, from Millennium Station to University Park) = PE PASSENGER ELECTRIFIED
METRA (otherwise) = P PASSENGER
MetroLink = PE PASSENGER ELECTRIFIED
South Shore Line by NICTD = PE PASSENGER ELECTRIFIED

B.RR.02 Railroad Minimum Vertical Clearance

Existing Bridges: Coding Guide Item 54A/54B Reference Feature / Minimum Vertical Underclearance
Field measure. Do not enter from plan dimensions.
Do Not Report when no Railroad Feature is reported. Report only when Railroad Feature is Below.

B.RR.03 Railroad Minimum Horizontal Offset

Existing Bridges: Coding Guide Item 55A/55B Reference Feature / Minimum Lateral Underclearance on Right
Field measure. Do not enter from plan dimensions.
Do Not Report when no Railroad Feature is reported. Report only when Railroad Feature is Below.

SNBI SUBSECTION 4.5: NAVIGABLE WATERWAYS

4.5 Navigable Waterways	
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

Find the approved Navigation Permit plans for information.

B.N.01 Navigable Waterway

Existing Bridges: Coding Guide Item 38 Navigation Control, Illinois Item 38A Coast Guard

Do Not Report for bridges without a W## Feature.

Illinois has 1,095 miles of navigable waterways that either border or pass through the state.

The 2025 Bridge Manual lists these USCG Permit Waterways

Eighth Coast Guard District – St. Louis, Missouri	
Waterway	**Upper Limit**
Big Muddy River	Murphysboro, Illinois, Mile 37.5
Chain of Rocks Canal	In its entirety
Des Plaines River	Mile 291.1
Chicago Sanitary and Ship Canal	S. of 9th St. in Lockport
Illinois River	Confluence Kankakee and Des Plaines River, Mile 273.0
Kaskaskia River	Fayetteville, Illinois, Mile 36.2
Little Wabash River	Mile 39.7
Ohio River	In its entirety
Upper Mississippi River	In its entirety
Carr Creek	Mile 2.4
Fountain Creek	Mile 5.75
Massac Creek	Mile 2.2
Big Grande Pierre Creek	Mile 6.0
Mary's River	Mile 14.0
Round Springs	Mile 0.8
Quincy Bay	In its entirety
Chaney Creek	Mile 0.5
Grays Bay	Mile 0.4
Larry Creek	Mile 0.9
Sonora Creek	Mile 0.6
Waggoner Creek	Mile 0.7
Riley Creek	Mile 0.4

Continued on next page for 9th CG District.

Ninth Coast Guard District – Cleveland, Ohio	
Waterway	**Upper Limit**
Waukegan Harbor	In its entirety
Chicago River:	
Main Branch	In its entirety
North Branch and North Branch Canal	Mile 7.29 (Addison Street)
South Branch	In its entirety
South Fork of S. Branch	In its entirety
Chicago Sanitary and Ship Canal	N. of 9th St. in Lockport
Calumet - Sag Channel	In its entirety
Little Calumet River	Calumet - Sag Channel
Calumet River	In its entirety
Lake Calumet	In its entirety
Grande Calumet River	State line

B.N.02 Navigation Minimum Vertical Clearance

Existing Bridges: Coding Guide Item 39/43B/116 Navigation Vertical Clearance / Type of Design/Construction / Minimum Navigation Vertical Clearance Vertical Lift Bridge

Do Not Report if not navigable.

B.N.03 Movable Bridge Maximum Navigation Vertical Clearance

Existing Bridges: Coding Guide Item 39/43B Navigation Vertical Clearance / Type of Design/Construction

Do Not Report if not navigable AND not movable.

B.N.04 Navigation Channel Width

Existing Bridges: Coding Guide Item 40 Navigation Horizontal Clearance

Do Not Report if not navigable.

B.N.05 Navigation Channel Minimum Horizontal Clearance

*** NEW ITEM ***

Do Not Report if not navigable.

B.N.06 Substructure Navigation Protection

Existing Bridges: Coding Guide Item 111 Pier or Abutment Protection (for Navigation)

Illinois Item 521 Number of Pier Protection Cells

SNBI SECTION 5: LOADS, LOAD RATING, AND POSTING

Section 5: Loads, Load Rating, and Posting
5.1 Loads and Load Rating
5.2 Load Posting Status
5.3 Load Evaluation and Posting

For IDOT load rating policies, refer to SSM Chapter 4, ABD 24.5 dated 11/15/2024, and Form BBS-2795.

SNBI SUBSECTION 5.1: LOADS AND LOAD RATING

5.1 Loads and Load Rating	
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

Find information in the load rating report. Design load and method may be shown on the plans.

B.LR.01 Design Load

Existing Bridges: Coding Guide Item 31 Design Load

Report U if unknown – do not leave blank.

B.LR.02 Design Method

*** NEW ITEM ***

Without plans, can infer based on design characteristics.

AASHTO adopted LFD in 1973 and LRFD in 1993.

IDOT mandated the use of LFD in 1980 for all structures except:

- curved structures (ASD until other methods developed)
- in-kind widening (same method as design)

IDOT phased in the use of LRFD over several years beginning in 2003 and mandated its use in October 2007.

NOTE:
THE REST OF SUBSECTION 5.1 WILL BE POPULATED BY BBS LOAD RATERS ONLY.

B.LR.03 Load Rating Date

*** NEW ITEM *** Illinois Item 66C Last Rating Date, 66D Load Rating Inspection Date

Do Not Report if not load rated.

B.LR.04 Load Rating Method

Existing Bridges: Coding Guide Item 63 Method Used To Determine Operating Rating

Illinois Item 64D Operating/Inventory Remarks

Report N if not rated– do not leave blank.

B.LR.05 Inventory Load Rating Factor

Existing Bridges: Coding Guide Item 66 Inventory Rating

Do Not Report if not load rated.

TRUNCATE to the hundredth. Do not round up.

B.LR.06 Operating Load Rating Factor

Existing Bridges: Coding Guide Item 64 Operating Rating

Do Not Report if not load rated.

TRUNCATE to the hundredth. Do not round up.

B.LR.07 Controlling Legal Load Rating Factor

*** NEW ITEM ***

Report the rating factors for individual LEGAL VEHICLES. Do not include permit loads in this evaluation.

Do Not Report if not load rated.

TRUNCATE to the hundredth. Do not round up.

B.LR.08 Routine Permit Loads

*** NEW ITEM ***

Report N when no routine permit loads cross bridge – do not leave blank.

This is a three-part issue, based on permitting, capacity, and restrictions – code accordingly:

Code	Does the bridge carry routine permit loads?	Is the bridge capacity adequate for routine permit loads?	Are routine permit loads restricted (meaning not allowed to cross the bridge)?
A	Yes	Yes – All	No – all are allowed
B	Yes	Some	Some
C	No	No – None	Yes – none are allowed
N	No		Yes – none are allowed

SNBI SUBSECTION 5.2: LOAD POSTING STATUS

5.2 Load Posting Status	
B.PS.01	Load Posting Status
B.PS.02	Posting Status Change Date

B.PS.01 Load Posting Status

Existing Bridges: some data exists but needs manipulation to transfer

- Item 41 Structure Open, Posted, or Closed to Traffic

Do not leave blank – report PO for Permanent and Open, unless there is a posting or operational issue.

IDOT has expanded the codes for this Item to collect additional IDOT-only information (shown in orange font).

Operational Status	Not Built Yet	No Restriction				Posted or Restricted				Deleted	Not Linked	Closed			
		New, Not Open	Open, Not Inspected	Open	Needs Action	Weight	Other	Needs Reduction	Missing			F	B	C	E
Permanent	F	N	PI	PO	PA	PP	PR	PD	PM	D	Z	CF	CB	CC	CE
Temporary			TI	TO	TA	TP	TR	TD	TM	D	Z	CF	CB	CC	CE
Supported				SO	SA	SP	SR	SD	SM	D	Z	CF	CB	CC	CE

Dropdown 1

F – Proposed Structure
N – New
P – Permanent
T – Temporary
S – Supported
C – Closed
D – Deleted
Z – Not linked

Dropdown 2

O – Open
A – Needs Action
P – Posted weight restriction
R – Other restrictions
D – Needs Reduction
M – Missing
I – Needs to be inspected
B – Bridge closed; replacement/repairs anticipated within the next 5 years
C – Road closed; closure not related to the condition of the structure
E – Bridge closed; permanent closure due to the structure condition, replacement/repairs not anticipated within the next 5 years or closed for more than 5 years
F – Bridge closed; replacement/repairs under contract

B.PS.02 Posting Status Change Date

*** NEW ITEM ***

Find in the load rating report or inspection report.
Report the date the bridge's posting status became the value reported for B.PS.01 Load Posting Status.

Values are not required to be researched or reported before the first SNBI submittal. However, a value IS expected – do not leave blank.

If the bridge has never changed posting status, report the date of inventory. Here's the reasoning for this:

- SNBI doesn't state "leave it blank" for ANY field. "Do not report" is stated for many items, but not for this item.
- For B.PS.01 Load Posting Status = "Permanent Open," then to "Report the date the bridge entered the status reported in Item B.PS.01," Item B.PS.02 is the date the bridge entered that status, which is the date it was opened to traffic.
- If the date of the inventory inspection is available, use that. If that inspection mentions the actual date the bridge was opened to traffic, that's even better. Without either of those, use January 1st of the year built.

SNBI SUBSECTION 5.3: LOAD EVALUATION AND POSTING

5.3 Load Evaluation and Posting	
B.EP.01	Legal Load Configuration
B.EP.02	Legal Load Rating Factor
B.EP.03	Posting Type
B.EP.04	Posting Value

Find information in the load rating report.

B.EP.01 Legal Load Configuration

*** NEW ITEM ***

NOTE: THIS ITEM WILL BE POPULATED BY BBS LOAD RATERS ONLY.

Only report configurations that have been rated.
IDOT rates Emergency Vehicles EV2 and EV3 and will report these vehicles.
IDOT rates notional loads that envelop the load effects of AASHTO Legal Loads (Types 3, 3-3, 3S2, SU4, SU5, SU6, SU7) and Illinois Statutory Loads. Once IDOT adopts SNBI errata #1, the following legal loads will be reported by adding the letter S to the beginning of the name:

Single Unit	Combo
IL-PS2-21	IL-PC3-31
IL-PS3-31	IL-PC4-41
IL-PS4-28	IL-PC5-41
IL-PS4-34.75	IL-PD6-40
IL-PS5-36	
IL-PS6-35.75	
IL-PS7-39.75	

B.EP.02 Legal Load Rating Factor

*** NEW ITEM ***

NOTE: THIS ITEM WILL BE POPULATED BY BBS LOAD RATERS ONLY.

TRUNCATE to the hundredth. Do not round up.

Some data exists but needs manipulation to transfer:

- Illinois Item 64F Emergency Vehicle Operating Rating
- Illinois Item 64G Emergency Vehicle Operating Rating
- Illinois Item 70A1 Allowable Single Unit Weight Limit
- Illinois Item 70B1 Allowable Combination Type 3S-1 Weight Limit
- Illinois Item 70C1 Allowable Combination Type 3S-2 Weight Limit
- Illinois Item 70D1 Allowable One Truck At A Time

B.EP.03 Posting Type

*** NEW ITEM ***

NOTE: THIS ITEM WILL BE TRANSLATED BY ISIS.

Inspectors will enter posting values in ISIS as usual, and ISIS will convert the data to the SNBI Posting Items.
Do Not Report if not field posted.
For gross posting, report “Gross” for all rated vehicles.

B.EP.04 Posting Value

*** NEW ITEM ***

NOTE: THIS ITEM WILL BE TRANSLATED BY ISIS.

Inspectors will enter posting values in ISIS as usual, and ISIS will convert the data to the SNBI Posting Items.
Do Not Report if not field posted.
Do Not Report for non-load-specific Posting Types C S, L, and V.
For gross posting, report the gross weight limit for all rated vehicles.

Posting Value must be reported for all vehicles with a Legal Load Rating Factor less than one:

- when B.EP.03 = G, A, D, T, or X (Gross Load, Single Axle Load, Tandem Axle Load, Truck Load, or Other).

Some data exists but needs manipulation to transfer:

- Illinois Item 70A2 Posted Single Unit Weight Limit
- Illinois Item 70B2 Posted Combination Type 3S-1 Weight Limit
- Illinois Item 70C2 Posted Combination Type 3S-2 Weight Limit
- Illinois Item 70D2 Posted One Truck At A Time

SNBI SECTION 6: INSPECTIONS

Section 6: Inspections
6.1 Inspection Requirements
6.2 Inspection Events

SNBI SUBSECTION 6.1: INSPECTION REQUIREMENTS

6.1 Inspection Requirements	
B.IR.01	NSTM Inspection Required
B.IR.02	Fatigue Details
B.IR.03	Underwater Inspection Required
B.IR.04	Complex Feature

B.IR.01 NSTM Inspection Required

Existing Bridges: Coding Guide Item 92A Critical Feature Inspection – Fracture Critical Details
Report N for not required on bridges with steel members.
Do Not Report if bridge has no steel members in the superstructure (B.SP.04) OR substructure (B.SB.03).

B.IR.02 Fatigue Details

*** NEW ITEM *** Illinois Item 92A1 Fracture Critical Bridge Type
Use plan data and/or field evaluation to determine whether the bridge has fatigue category E or E' details.
Do Not Report if bridge has no steel members in the superstructure (B.SP.04) OR substructure (B.SB.03).
See BIRM 7.3.5 AASHTO Detail Categories for Load-Induced Fatigue for the 8-page chart of Detail Categories, which is taken from the AASHTO LRFD Bridge Design Specifications Table 6.6.1.2.3-1.

- The E and E' details are copied to APPENDIX C – E/E' FATIGUE DETAIL CATEGORIES for B.IR.02

Inspectors should photograph typical fatigue details at the next inspection for inclusion in the NSTM BSIP (Bridge Specific Inspection Procedures) document.

B.IR.03 Underwater Inspection Required

Existing Bridges: Coding Guide Item 92B Critical Feature Inspection – Underwater Inspection
Do Not Report for bridges without a W## Feature.
For bridges without a W## Feature, report N if not required – do not leave blank.

B.IR.04 Complex Feature

*** NEW ITEM ***
Use plan data and/or field evaluation to determine.
Report N if not applicable – do not leave blank.
Use CFR 650.305 definitions: includes mechanical, electrical, movable bridges, and cables.

SNBI SUBSECTION 6.2: INSPECTION EVENTS

6.2 Inspection Events	
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

B.IE.01 Inspection Type

Existing Bridges: Coding Guide Items 90/92/93 Inspection Date / Critical Feature Inspection / Critical Feature Inspection Date

B.IE.02 Inspection Begin Date

Existing Bridges: Coding Guide Item 90/93 Inspection Date / Critical Feature Inspection Date

B.IE.03 Inspection Completion Date

*** NEW ITEM ***

See inspection report for any notes about duration of inspection.

Typically, but certainly not always, an inspection is 1 day in length, so B.IE.02 = B.IE.03.

B.IE.04 Nationally Certified Bridge Inspector

*** NEW ITEM *** Illinois Item 90A1 Routine Inspection Team Leader, 93B3 Underwater Team Leader

This is a unique code (not a name) assigned by Program Manager.

ISIS will make the conversion from the inspector's entered name to the corresponding code.

Limited to 15 characters total.

B.IE.05 Inspection Interval

Existing Bridges: Coding Guide Item 91/92 Designated Inspection Frequency / Critical Feature Inspection

Report 0 for damage inspections, scour monitoring inspections, or when a special inspection does not have a defined inspection interval– do not leave blank.

B.IE.06 Inspection Due Date

*** NEW ITEM ***

Calculated by FHWA – do not report.

Equals B.IE.03 INSPECTION COMPLETION DATE plus B.IE.05 INSPECTION INTERVAL.

B.IE.07 Risk-Based Inspection Interval Method

*** NEW ITEM ***

IDOT is only using Method 1.

Report per inspection type:

- Routine, UW, NSTM will be METHOD 1.
- Initial, Damage, In-Depth, Special, Service, Scour will be N NOT APPLICABLE.

B.IE.08 Inspection Quality Control Date

*** NEW ITEM ***

Do Not Report if not performed yet.

This is the date the Program Manager reviews and approves the inspection in ISIS.

Aim to complete QC & QA within the same reporting period as the inspection.

B.IE.09 Inspection Quality Assurance Date

*** NEW ITEM ***

Only performed when the bridge is selected for the annual IDOT QA Review.

Do Not Report if not performed yet.

Aim to complete QC & QA within the same reporting period as the inspection.

B.IE.10 Inspection Data Update Date

*** NEW ITEM ***

ISIS is tracking this Item. No input is needed by the user.

B.IE.11 Inspection Note

*** NEW ITEM ***

Intended for when limited portions of the bridge are inspected.

SNBI example shows a blank for the routine inspection.

B.IE.12 Inspection Equipment

*** NEW ITEM ***

See inspection report and photos.

Check the No Equipment Used box if none used.

Most commonly used: A05 Waders

SNBI SECTION 7: BRIDGE CONDITION

Section 7: Bridge Condition
7.1 Component Condition Ratings
7.2 Element Identification
7.3 Element Conditions
7.4 Appraisal
7.5 Work Events

SNBI SUBSECTION 7.1: COMPONENT CONDITION RATINGS

7.1 Component Condition Ratings	
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

These items will be coded for all future inspections. Past inspections have not rated these new components. DO NOT code these Items for past inspections.

For the SNBI Condition Description charts for B.C.01 thru B.C.11, SNBI states:
"The entire code description must be satisfied for the code to apply." FHWA instructors attempted to clarify this, saying, "the semicolon means ***and,***" meaning all the conditions stated in the description must be met.

Align Component Condition Ratings with the relevant Element Condition States.

Consider these distinctions in the Condition Descriptions:

- Severity of defect: inherent, minor, moderate, or major.
- Extent of defect: isolated, some, or widespread.
- Condition Rating 4 and below: strength becomes affected.

B.C.01-07 and B.C.14-15 use Condition Descriptions in Table 20:

- Deck, Superstructure, Substructure, Culvert, Bridge Railing, Railing Transitions, Bearings, NSTM, UW.

B.C.08-11 each have unique condition description tables:

- Joints, Channel, Channel Protection, Scour

B.C.12-13 are calculated by FHWA and not reported: Bridge Condition Classification, Lowest Condition Rating.

B.C.01 Deck Condition Rating

Existing Bridges: Coding Guide Item 58 Deck

Report N for a structure without a deck (B.SP.09 Deck Material=0 None).

B.C.02 Superstructure Condition Rating

Existing Bridges: Coding Guide Item 59 Superstructure

Report N for a structure without a deck (B.SP.09 Deck Material=0 None).

Superstructures without substructures (arches) may be affected by scour.

B.C.03 Substructure Condition Rating

Existing Bridges: Coding Guide Item 60 Substructure

Report N for a structure without a deck (B.SP.09 Deck Material=0 None).

Contact IDOT Scour Engineer if this causes reevaluation of B.AP.03 Scour Vulnerability.

B.C.04 Culvert Condition Rating

Existing Bridges: Coding Guide Item 62 Culvert

Contact IDOT Scour Engineer if this causes reevaluation of B.AP.03 Scour Vulnerability.

B.C.05 Bridge Railing Condition Rating

*** NEW ITEM ***

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 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.

Do not consider pedestrian railings when coding this item, except to the extent that the pedestrian railing is integral to the traffic barrier.

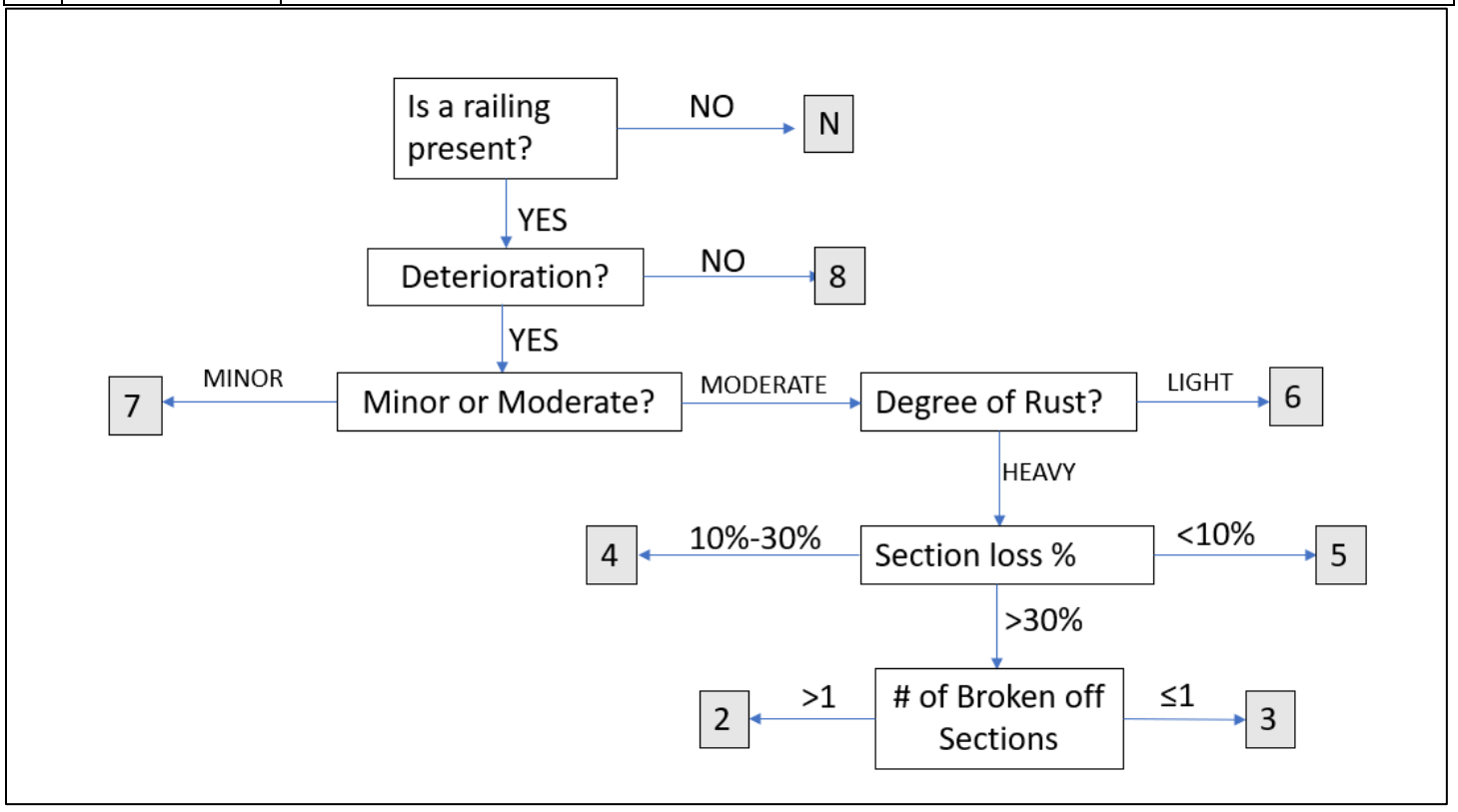
Do not consider the condition of protective coatings and other protection systems when determining the condition rating code for this item, except to the extent that problems with the protective coating system are indicative of problems with the underlying railing material.
History is retained for this item based on each Inspection Date (Item 90 | B.IE.03).

CONDITION RATING GUIDES FOR CODES N, 9, 1, AND 0
FOR ALL RAILING MATERIAL TYPES

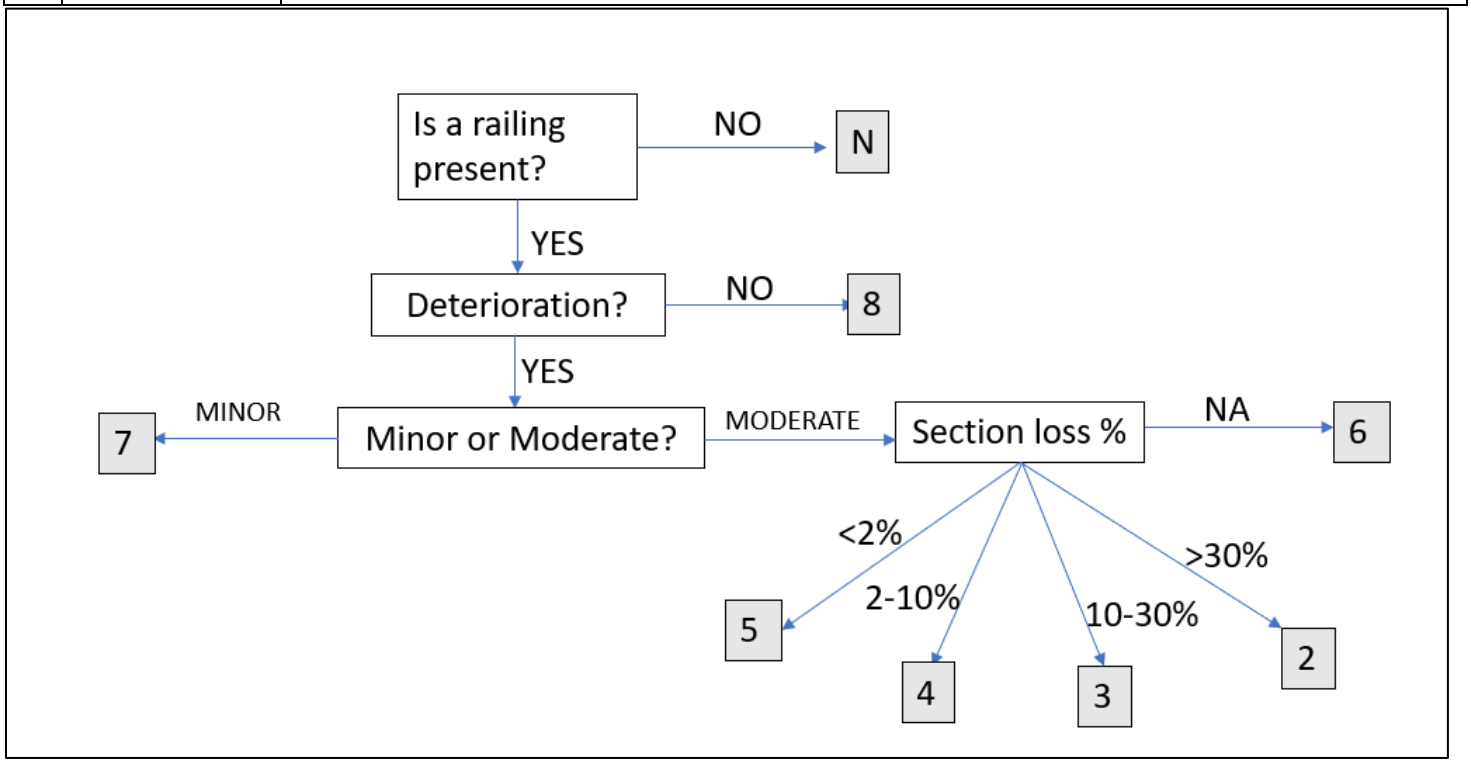
N	**NOT APPLICABLE**	Component does not exist.
9	**EXCELLENT**	New railing. (first inspection after installation)
1	**IMMINENT FAILURE**	Railing in “imminent failure” condition; section(s) broken off more than present.
0	**FAILED**	Railing failed, crash impacted, non-functional; replacement railing is needed as soon as possible. Signage required.

See the following pages for guidance specific to Steel, Concrete, and Timber Railings.

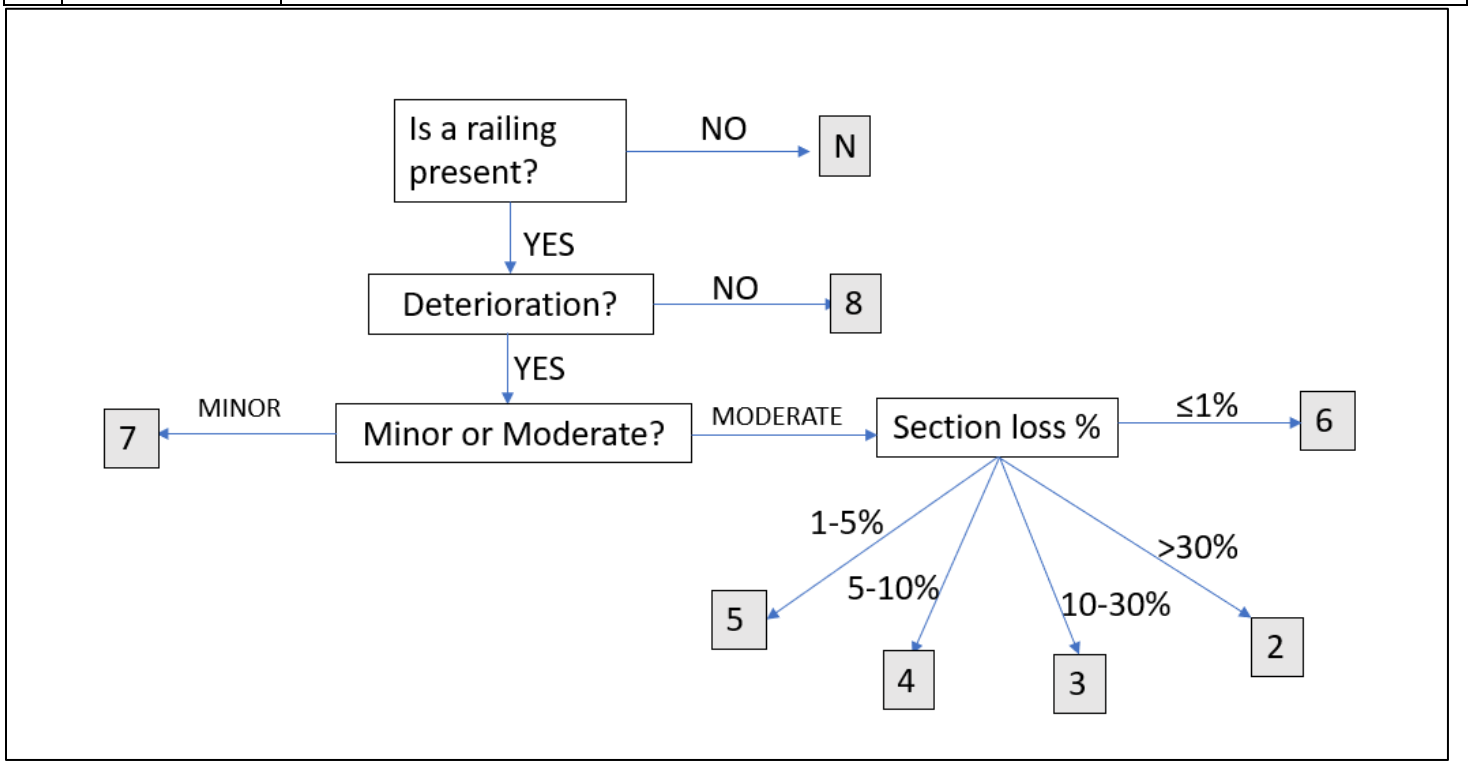
8	**VERY GOOD**	**Some inherent defects.** No deficiencies.
7	**GOOD**	**Some minor defects.** Minor dents, scratches, and gouges.
6	**SATISFACTORY**	**Widespread minor or isolated moderate defects.** Light rust. No missing connections or loose fasteners.
5	**FAIR**	**Some moderate defects; strength and performance of the railing is not affected.** Heavy rusting with up to 10% section loss. Isolated missing fasteners. The Railing Test Level category does not meet current specifications.
4	**POOR**	**Widespread moderate and isolated major defects; strength and/ or performance of the railing is affected.** Heavy rusting with up to 30% section loss. Some missing fasteners. Major dents, gouges, and misalignment.
3	**SERIOUS**	**Major defects; strength and/ or performance of the railing is seriously affected.** > 30% section loss. 1 section is broken off. Widespread missing fasteners. Crash worthiness evaluation warranted.
2	**CRITICAL**	**Major defects; railing is severely compromised.** > 30% section loss. > 1 section is broken off. Widespread missing fasteners. Crash worthiness evaluation warranted.



8	**VERY GOOD**	**Some inherent defects.** No deficiencies.
7	**GOOD**	**Some minor defects.** Vertical cracking present. Minor popouts with no exposed reinforcement.
6	**SATISFACTORY**	**Widespread minor or isolated moderate defects.** No section loss. Some delaminated areas.
5	**FAIR**	**Some moderate defects; strength and performance of the railing is not affected.** Delaminated and spalled with exposed reinforcement area up to 2%. Patched area that is sound. Spall 1 in. or less deep or 6 in. or less in diameter. The Railing TL category does not meet current standards.
4	**POOR**	**Widespread moderate and isolated major defects; strength and/ or performance of the railing is affected.** Delaminated and spalled with exposed reinforcement area up to 10%. Spall 1 in. or less deep or 6 in. or less in diameter. Patched area that is unsound.
3	**SERIOUS**	**Major defects; strength and/ or performance of the railing is seriously affected.** Delaminated and spalled with exposed reinforcement area up to 30%. Spall >1 in. deep or > 6 in. in diameter. Patched area that is unsound. Crash worthiness evaluation warranted.
2	**CRITICAL**	**Major defects; railing is severely compromised.** Delaminated and spalled with exposed reinforcement area >30%. Spall >1 in. deep or > 6 in. in diameter. Patched area that is unsound. Crash worthiness evaluation warranted.



8	**VERY GOOD**	**Some inherent defects.** No deficiencies
7	**GOOD**	**Some minor defects.** Minor checks, shakes, and splits.
6	**SATISFACTORY**	**Widespread minor or isolated moderate defects.** Isolated decay/Section loss up to 1%. No missing connections or loose fasteners. Fire damage limited to scorching of surface.
5	**FAIR**	**Some moderate defects; strength and performance of the railing is not affected.** Decay/Section Loss up to 5%. Isolated missing fasteners. Fire damage limited to charring of surface.
4	**POOR**	**Widespread moderate and isolated major defects; strength and/ or performance of the railing is affected.** Decay/Section Loss up to 10%. Some missing fasteners. Major checks, shakes, and splits. Does not warrant structural review.
3	**SERIOUS**	**Major defects; strength and/ or performance of the railing is seriously affected.** Decay/section loss up to 30%. Widespread missing fasteners. Crash worthiness evaluation warranted.
2	**CRITICAL**	**Major defects; railing is severely compromised.** > 30% section loss. Widespread missing fasteners. Crash worthiness evaluation warranted.



B.C.06 Bridge Railing Transitions Condition Rating

*** NEW ITEM ***

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

The approach guardrail must be firmly attached to the bridge railing. The approach guardrail must be gradually stiffened as it nears the bridge railing.

Needed repairs must be recorded on designated forms and reported to appropriate personnel in accordance with the policies of the maintaining agency.

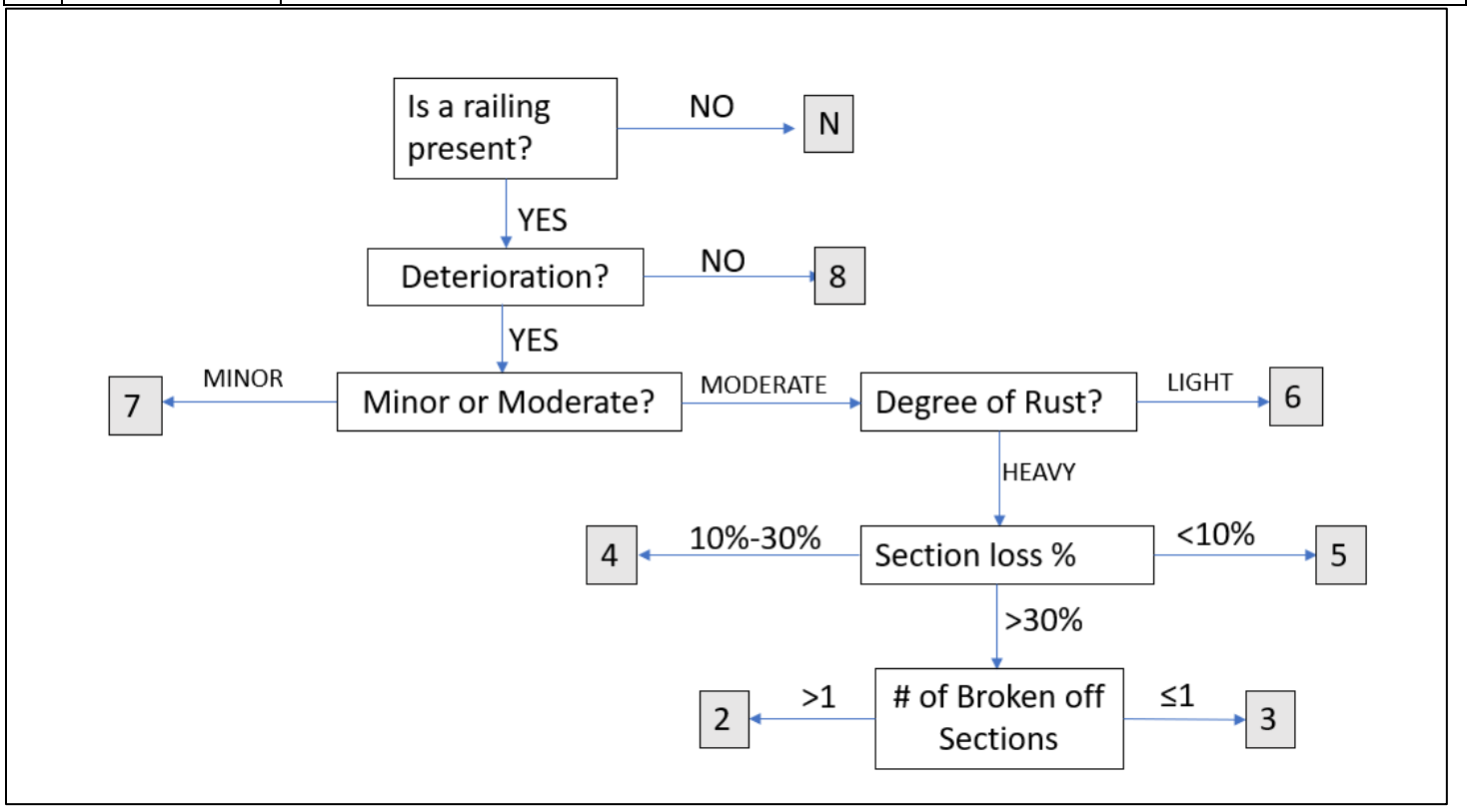
History is retained for this item based on each Inspection Date (Item 90 | B.IE.03).

CONDITION RATING GUIDES FOR CODES N, 9, 1, AND 0
FOR ALL RAILING MATERIAL TYPES

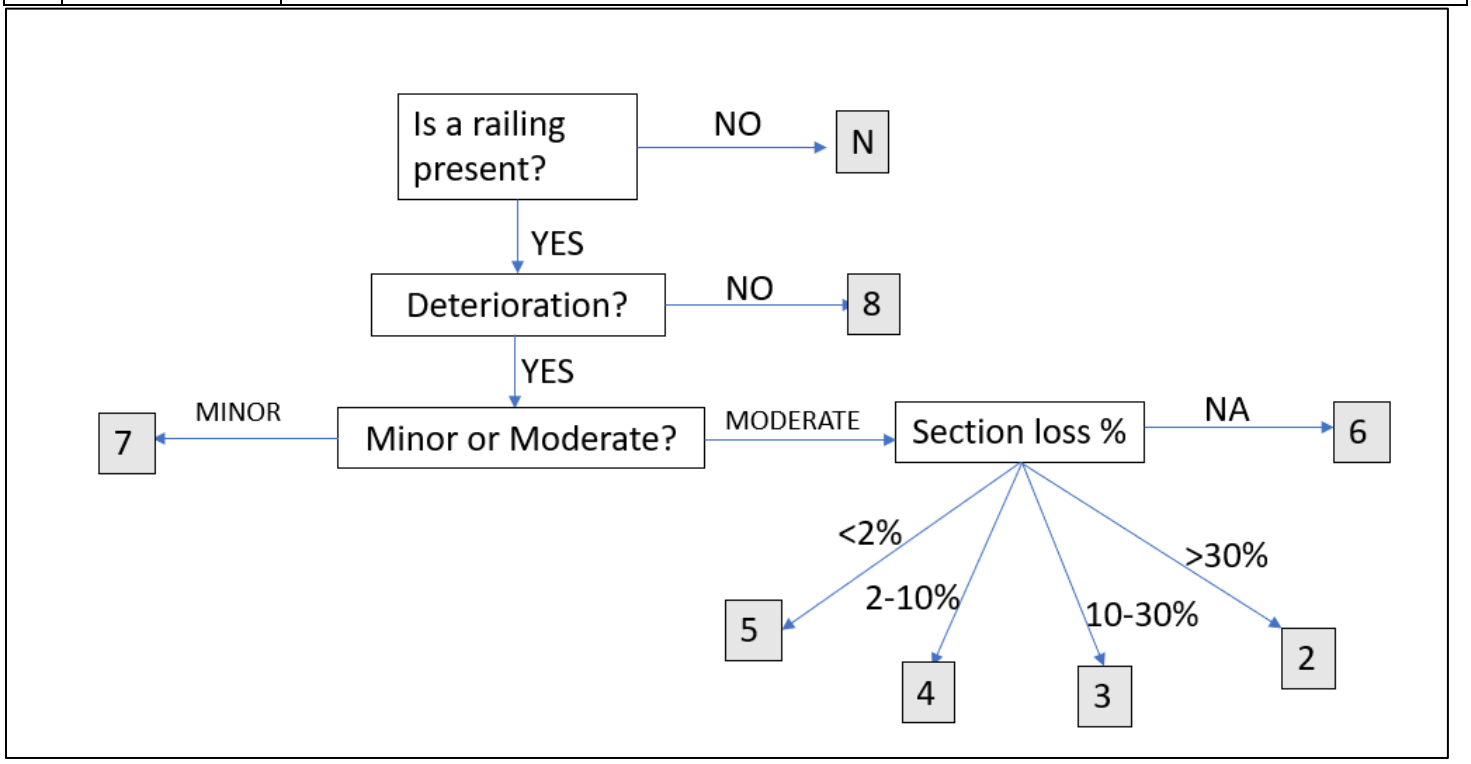
N	**NOT APPLICABLE**	Component does not exist.
9	**EXCELLENT**	New railing. (first inspection after installation)
1	**IMMINENT FAILURE**	Railing transition in “imminent failure” condition; section(s) broken off more than present.
0	**FAILED**	Railing transition failed, crash impacted, non-functional; replacement railing transition is needed.

See the following pages for guidance specific to Steel, Concrete, and Timber Railing Transitions.

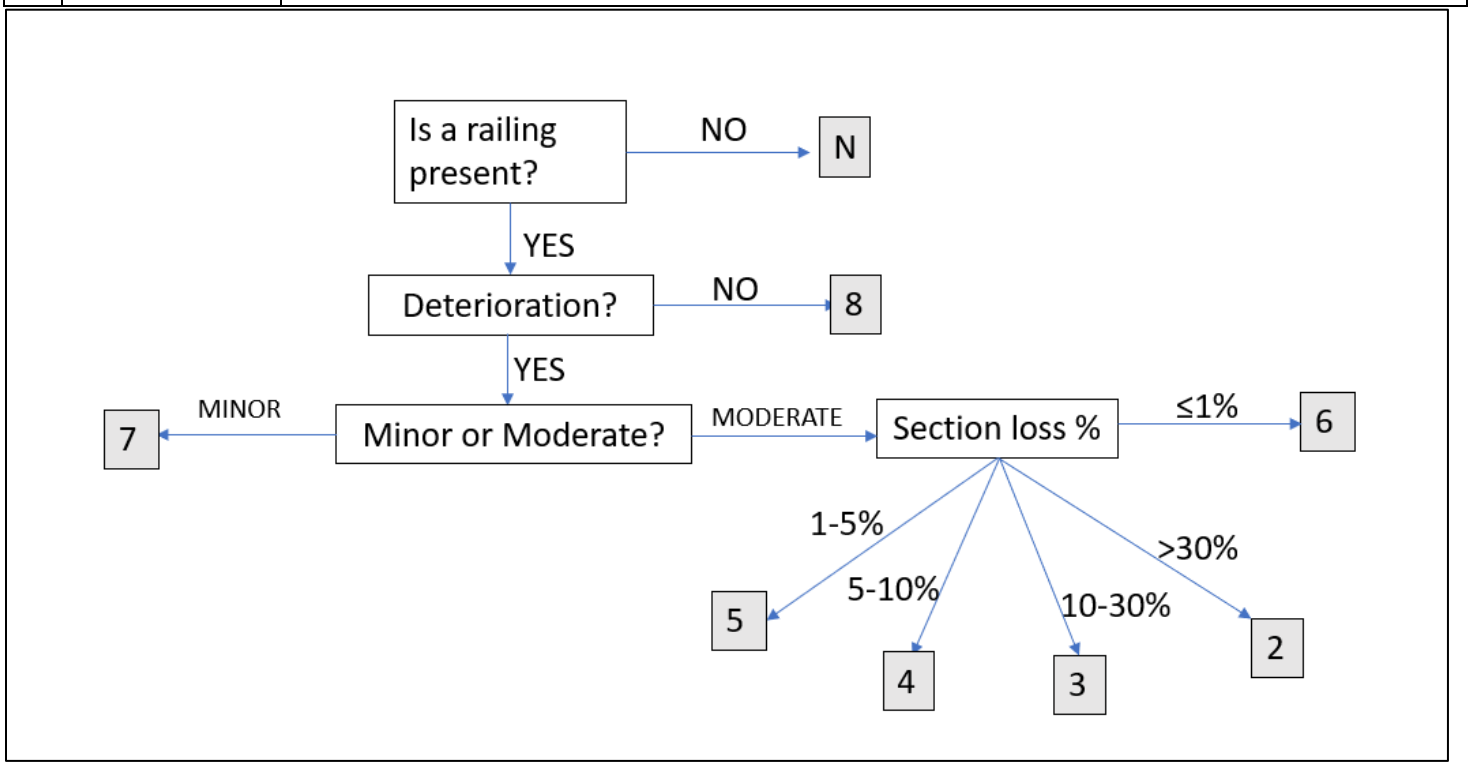
8	**VERY GOOD**	**Some inherent defects.** No deficiencies.
7	**GOOD**	**Some minor defects.** Minor dents, scratches, and gouges.
6	**SATISFACTORY**	**Widespread minor or isolated moderate defects.** Light rust. No missing connections or loose fasteners.
5	**FAIR**	**Some moderate defects; strength and performance of the railing is not affected.** Heavy rusting with up to 10% section loss. Isolated missing fasteners. The Railing Test Level category does not meet current specifications.
4	**POOR**	**Widespread moderate and isolated major defects; strength and/ or performance of the railing is affected.** Heavy rusting with up to 30% section loss. Some missing fasteners. Major dents, gouges, and misalignment.
3	**SERIOUS**	**Major defects; strength and/ or performance of the railing is seriously affected.** > 30% section loss. 1 section is broken off. Widespread missing fasteners. Crash worthiness evaluation warranted.
2	**CRITICAL**	**Major defects; railing is severely compromised.** > 30% section loss. > 1 section is broken off. Widespread missing fasteners. Crash worthiness evaluation warranted.



8	**VERY GOOD**	**Some inherent defects.** No deficiencies.
7	**GOOD**	**Some minor defects.** Vertical cracking present. Minor popouts with no exposed reinforcement.
6	**SATISFACTORY**	**Widespread minor or isolated moderate defects.** No section loss. Some delaminated areas.
5	**FAIR**	**Some moderate defects; strength and performance of the railing is not affected.** Delaminated and spalled with exposed reinforcement area up to 2%. Patched area that is sound. Spall 1 in. or less deep or 6 in. or less in diameter. The Railing TL category does not meet current standards.
4	**POOR**	**Widespread moderate and isolated major defects; strength and/ or performance of the railing is affected.** Delaminated and spalled with exposed reinforcement area up to 10%. Spall 1 in. or less deep or 6 in. or less in diameter. Patched area that is unsound.
3	**SERIOUS**	**Major defects; strength and/ or performance of the railing is seriously affected.** Delaminated and spalled with exposed reinforcement area up to 30%. Spall >1 in. deep or > 6 in. in diameter. Patched area that is unsound. Crash worthiness evaluation warranted.
2	**CRITICAL**	**Major defects; railing is severely compromised.** Delaminated and spalled with exposed reinforcement area >30%. Spall >1 in. deep or > 6 in. in diameter. Patched area that is unsound. Crash worthiness evaluation warranted.



8	**VERY GOOD**	**Some inherent defects.** No deficiencies
7	**GOOD**	**Some minor defects.** Minor checks, shakes, and splits.
6	**SATISFACTORY**	**Widespread minor or isolated moderate defects.** Isolated decay/Section loss up to 1%. No missing connections or loose fasteners. Fire damage limited to scorching of surface.
5	**FAIR**	**Some moderate defects; strength and performance of the railing is not affected.** Decay/Section Loss up to 5%. Isolated missing fasteners. Fire damage limited to charring of surface.
4	**POOR**	**Widespread moderate and isolated major defects; strength and/ or performance of the railing is affected.** Decay/Section Loss up to 10%. Some missing fasteners. Major checks, shakes, and splits. Does not warrant structural review.
3	**SERIOUS**	**Major defects; strength and/ or performance of the railing is seriously affected.** Decay/section loss up to 30%. Widespread missing fasteners. Crash worthiness evaluation warranted.
2	**CRITICAL**	**Major defects; railing is severely compromised.** > 30% section loss. Widespread missing fasteners. Crash worthiness evaluation warranted.



B.C.07 Bridge Bearings Condition Rating

*** NEW ITEM ***

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. Cork does not count as a bearing.

Inspect bearings to verify proper functionality, tightened anchor bolt nuts surrounded by sound concrete, freedom of movement, acceptable vertical and lateral alignment, etc.

Needed repairs must be recorded on designated forms and reported to appropriate personnel in accordance with the policies of the maintaining agency.

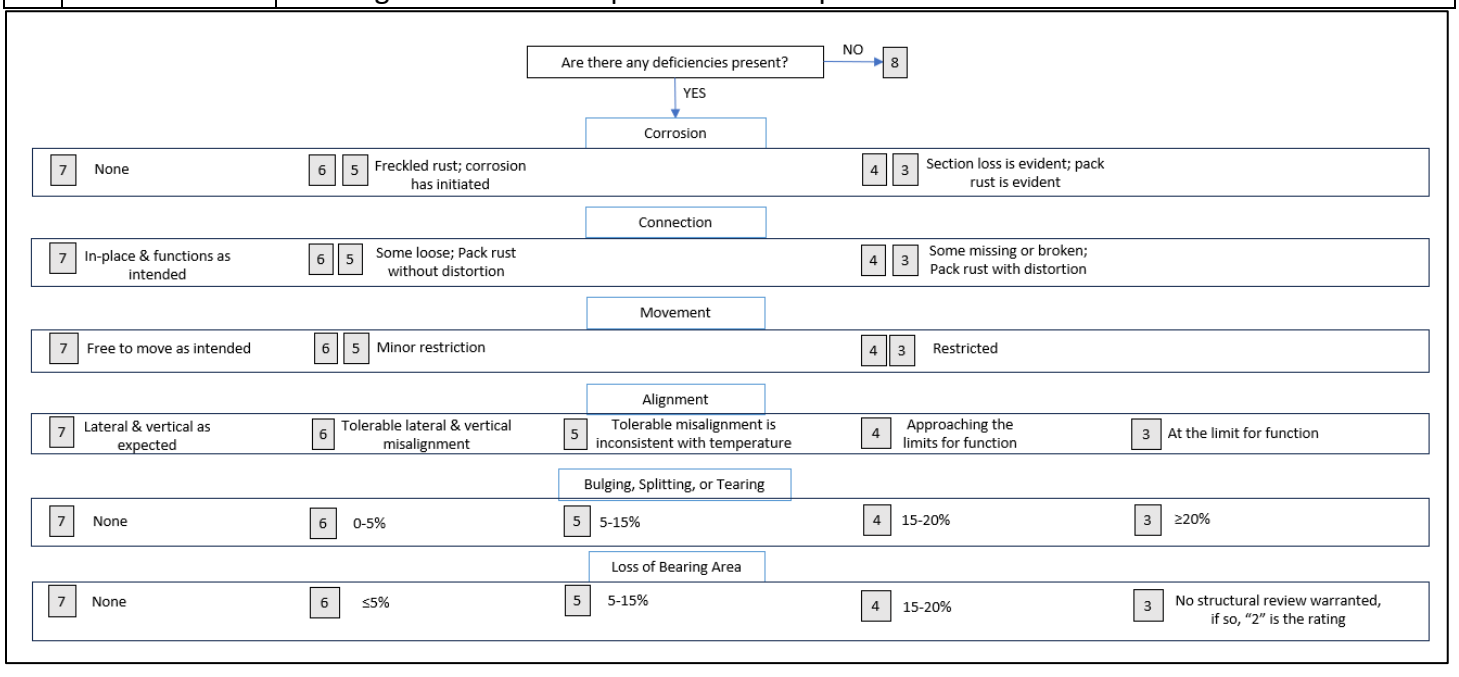
History is retained for this item based on each Inspection Date (Item 90 | B.IE.03).

The flow diagram for the bridge condition guide is intended for inspectors to assign a rating for each major defect category. From there, the inspector shall average those values and assign an overall rating.

CONDITION RATING GUIDES FOR BRIDGE BEARINGS
(Elastomeric, Fixed, Movable, Enclosed/Concealed, Pot, Disk, Other)

N	**NOT APPLICABLE**	**Component does not exist.** No bearings present
9	**EXCELLENT**	**Isolated Inherent defects** New bearing. (first inspection after installation)
8	**VERY GOOD**	**Some inherent defects.**
7	**GOOD**	**Some minor defects.** Corrosion: none. Connections: in place and functioning as intended. Movement: free to move as intended. Alignment: lateral and vertical as expected for temperature conditions. Elastomer: no bulging or splitting. Bearing area: none.
6	**SATISFACTORY**	**Widespread minor or isolated moderate defects.** Corrosion: freckled rust; corrosion has initiated. Connections: some loose; pack rust without distortion; still functioning. Movement: minor restriction Alignment: tolerable lateral or vertical misalignment. Elastomer: bulging 0-5% or minor splitting. Bearing area: less than 5% loss.

5	**FAIR**	**Some moderate defects; strength and performance of the component are not affected.** Corrosion: freckled rust; corrosion has initiated. Connections: some loose; pack rust without distortion; still functioning. Movement: minor restriction. Alignment: tolerable misalignment is inconsistent with temperature. Elastomer: bulging 5-15% or minor splitting. Bearing area: 5-10% loss.
4	**POOR**	**Widespread moderate or isolated major defects; strength and/or performance is affected. Defects do not warrant structural review.** Corrosion: section loss is evident or pack rust is present. Connections: some missing or broken; pack rust with distortion. Movement: restricted. Alignment: Approaching the lateral or vertical limits for function. Elastomer: bulging 15-20%; splitting or tearing; surfaces not parallel. Bearing area: 10-20% loss.
3	**SERIOUS**	**Major defects; strength and/or performance is seriously affected. Defects may warrant structural review.** Corrosion: section loss is evident or pack rust is present Connections: missing or pack rust with distortion Movement: restricted Alignment: at the limit for function. Elastomer: bulging 20% or more; splitting or tearing; surfaces not parallel. Bearing area: 20% or more loss
2	**CRITICAL**	**Major defects; component is severely compromised.** Same defects as condition 3, but a structural review is warranted.
1	**IMMINENT FAILURE**	**Bridge is closed to traffic due to component condition.** Bearing is in a state of imminent failure. Repair or rehabilitation of the bearings may return the bridge to service condition.
0	**FAILED**	**Bridge is closed due to component condition and is beyond corrective action.** Bearing has failed and replacement is required to restore service.



B.C.08 Bridge Joints Condition Rating

*** NEW ITEM ***

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.

Joints shall be inspected for alignment, freedom for movement, deterioration, and damage not shown in previous inspections. The amount of dirt and debris accumulation shall be noted.

Needed repairs must be recorded on designated forms and reported to appropriate personnel in accordance with the policies of the maintaining agency.

History is retained for this item based on each Inspection Date (Item 90 | B.IE.03).

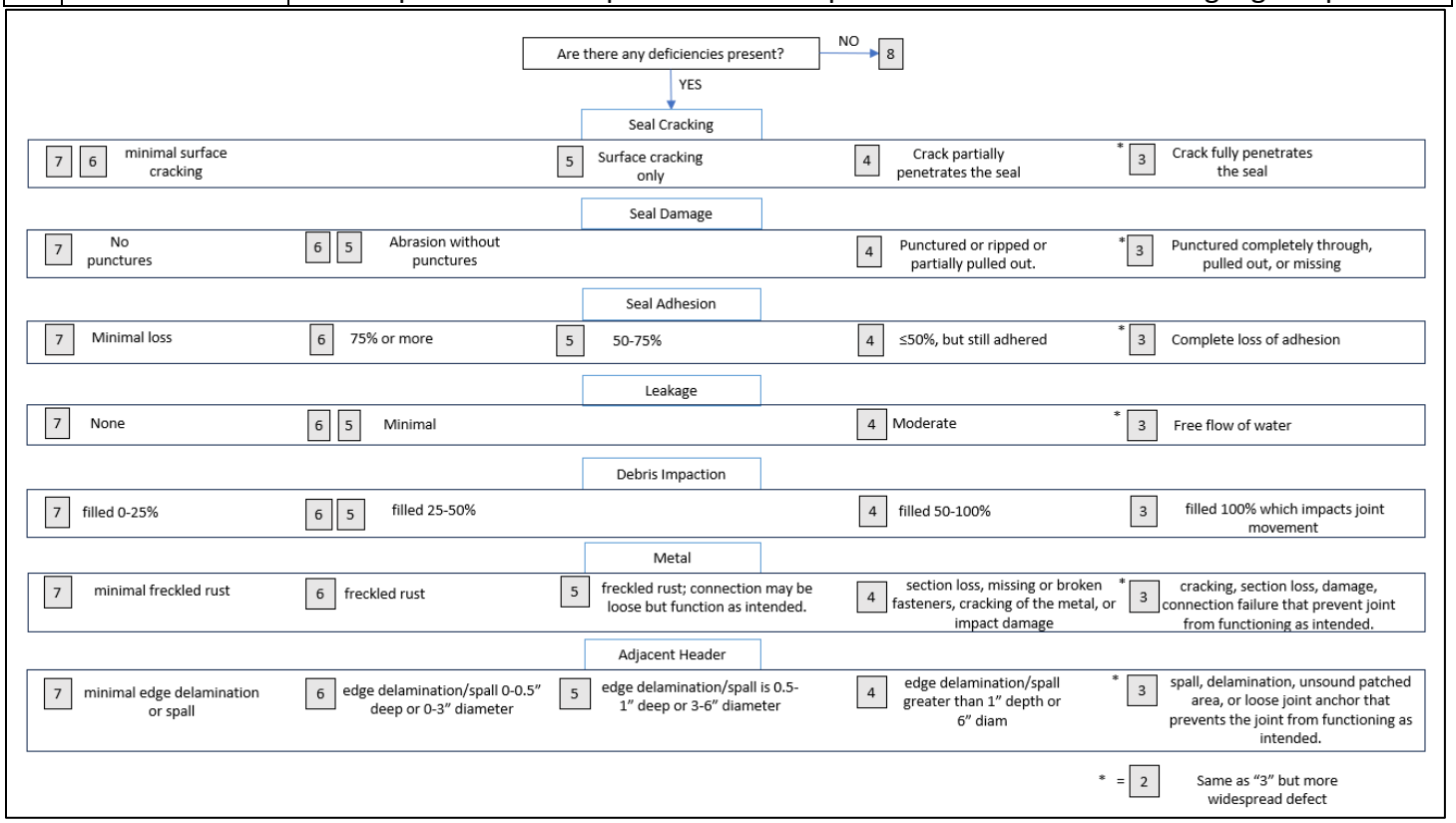
The flow diagram for the bridge condition guide is intended for inspectors to assign a rating for each major defect category. From there, the inspector shall average those values and assign an overall rating.

CONDITION RATING GUIDES FOR BRIDGE JOINTS

N	**NOT APPLICABLE**	**Component does not exist.** Bridge does not have deck joints
9	**EXCELLENT**	**Isolated inherent defects.** New joints. (first inspection after installation)
8	**VERY GOOD**	**Some inherent defects.** Leakage: none. Seal adhesion: fully adhered. Seal damage: none. Seal cracking: none. Debris impaction: no debris. Adjacent deck: sound. Metal: no deterioration or damage.

7	**GOOD**	**Some minor defects.** Leakage: none. Seal adhesion: minimal loss of adhesion. Seal damage: no punctures. Seal cracking: minimal surface cracking. Debris impaction: filled 0-25%; loose-packed material; free movement. Adjacent deck: minimal edge delamination or spall; no patched areas. Metal: minimal freckled rust; no cracks or impact damage.
6	**SATISFACTORY**	**Widespread minor or isolated moderate defects.** Leakage: minimal leakage is present. Minor dripping through the joint. Seal adhesion: adhered for 75% or more of the joint height. Seal damage: abrasion without punctures. Seal cracking: minimal surface cracking. Debris impaction: filled 25-50%; packed material; free movement. Adjacent deck: edge delamination/spall 0-0.5” deep or 0-3” diameter; no exposed rebar; no unsound patch. Metal: freckled rust; no cracks or impact damage.
5	**FAIR**	**Some moderate defects.** Leakage: minimal; minor dripping through the joint. Seal adhesion: adhered for 50-75% of the joint height. Seal damage: abrasion without punctures. Seal cracking: surface cracking only. Debris impaction: filled 50-100%; hard-packed material; free movement. Adjacent Deck: edge delamination/spall is 0.5-1” deep or 3-6” diameter; no exposed rebar; no unsound patch. Metal: freckled rust; no cracks or impact damage; connection may be loose but function as intended.
4	**POOR**	**Widespread moderate or isolated major defects.** Leakage: moderate; more than a drip and less than free flow of water. Seal adhesion: adhered 50% or less of joint height but still adhered. Seal damage: Punctured or ripped or partially pulled out. Seal cracking: crack partially penetrates the seal. Debris impaction: filled 100% which impacts joint movement. Adjacent deck: edge delamination/spall greater than 1” depth or 6” diam; exposed rebar; unsound patched area that makes the joint loose. Metal: section loss, missing or broken fasteners, cracking of the metal, or impact damage; but joint still functioning as intended.
3	**SERIOUS**	**Some major defects.** Leakage: free flow of water through the joint. Seal adhesion: complete loss of adhesion. Seal damage: punctured completely through, pulled out, or missing. Seal cracking: crack fully penetrates the seal. Debris impaction: completely filled and prevents joint movement Adjacent Header: spall, delamination, unsound patched area, or loose joint anchor that prevents the joint from functioning as intended. Metal: cracking, section loss, damage, connection failure that prevent joint from functioning as intended.

2	**CRITICAL**	**Widespread major defects.** Same defects as condition 3, but defects are widespread.
1	**IMMINENT FAILURE**	**Bridge is closed to traffic due to component condition.** Repair or rehabilitation of the joint may return the bridge to service.
0	**FAILED**	**Bridge is closed due to component condition.** Joint replacement is required as soon as possible to restore service. Signage required.



B.C.09 Channel Condition Rating

Existing Bridges: Coding Guide Item 61 Channel and Channel Protection

Contact IDOT Scour Engineer if this causes reevaluation of B.AP.03 Scour Vulnerability.

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.

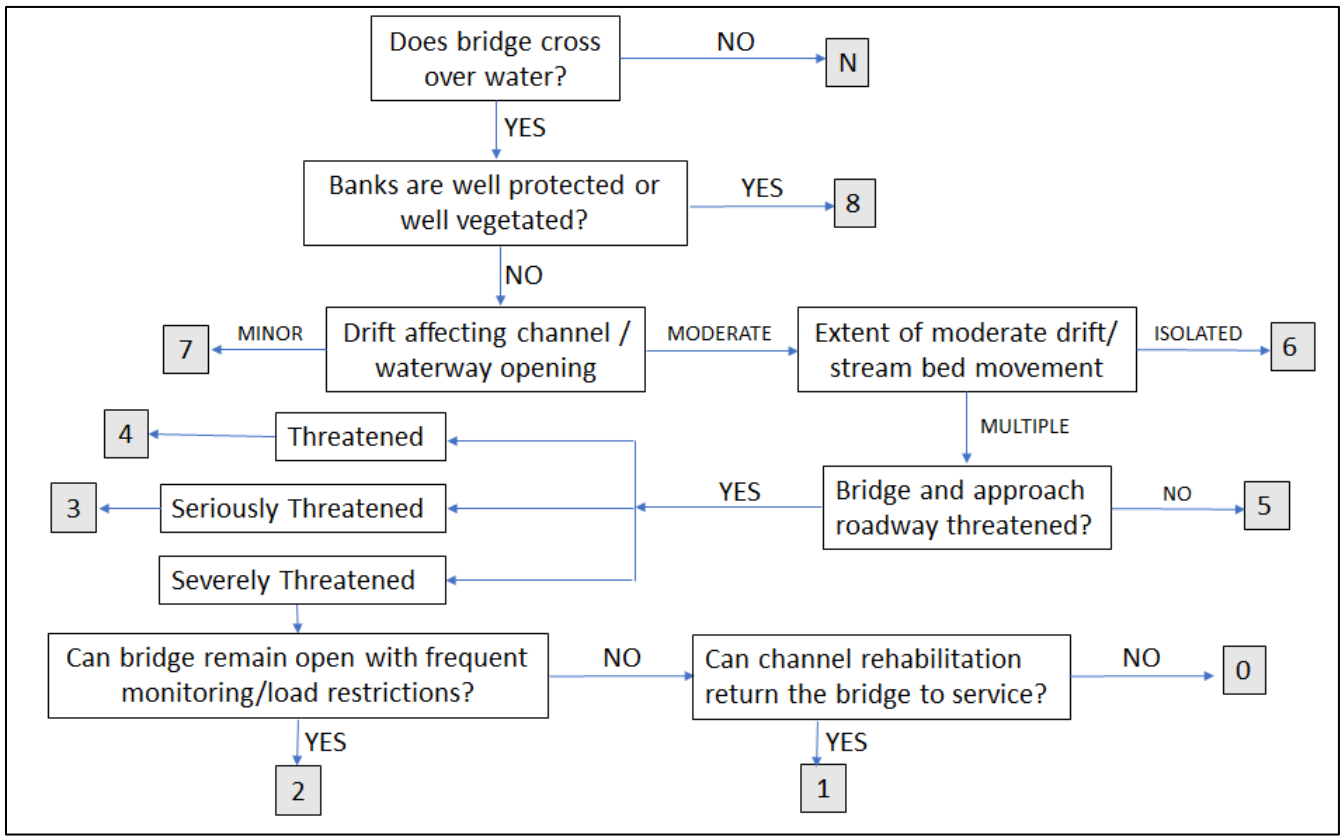
The condition of channel protection devices is addressed under a separate item. Refer to Item B.C.10 (Channel Protection Condition Rating). For concrete lined channels, channel defects typically do not apply, except for Aggradation and Debris.

This item describes the physical conditions associated with the flow of water through the bridge, such as stream stability and the condition of the channel, riprap, slope protection, or stream control devices, including spur dikes.

Consider these defects: aggradation, migration, drift, erosion, degradation, scour. The inspector must be particularly concerned with visible signs of excessive water velocity that may affect the undermining of slope protection or footings, erosion of banks, and realignment of the stream that may result in immediate or potential problems.

Needed repairs must be recorded on designated forms and reported to the appropriate personnel in accordance with the policies of the maintaining agency.

History is retained for this item based on each Inspection Date (Item 90 | B.EI.03).



CONDITION RATING GUIDES FOR CHANNEL

N	**NOT APPLICABLE**	**Channel does not exist.** Bridge does not cross over water.
9	**EXCELLENT**	**Isolated inherent defects.** (first inspection after installation)
8	**VERY GOOD**	**Some Inherent defects.** Banks are protected or well-vegetated. Any present protection devices are in stable condition.
7	**GOOD**	**Some minor defects**. Banks and/or channels may have minor amounts of drift not affecting the waterway opening.
6	**SATISFACTORY**	**Widespread minor or isolated moderate defects.** Defects affect up to 30% of channel area 50 ft. upstream and downstream. Bank is beginning to slump. There is minor streambed movement evident. Debris is restricting the waterway slightly.
5	**FAIR**	**Some moderate defects; strength and performance of the channel are not affected.** Bridge and approach roadway are not threatened. Defects affect up to 50% of channel area 50 ft. upstream and downstream. Bank protection is being eroded. Trees and brush restrict the channel.
4	**POOR**	**Widespread moderate or isolated major defects; strength and/or performance of the channel is affected.** Bridge and/or approach roadway is threatened. Defects affect >50% of channel area 50 ft. upstream and downstream. Bank and embankment protection is severely undermined. Deposits of debris in the waterways are severely restricting the opening.
3	**SERIOUS**	**Major defects; strength and/or performance of the channel is seriously affected. Condition typically necessitates more frequent monitoring, load restrictions, and/or corrective actions.** Bridge or approach roadway is seriously threatened. Bank protection has failed. Streambed aggradation, degradation or lateral movement has changed the waterway to now threaten the bridge and/or approach roadway.
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.** Bridge or approach roadway is severely threatened. The waterway has changed to the extent the bridge is near a state of collapse.
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.

B.C.10 Channel Protection Condition Rating

*** NEW ITEM ***

Contact IDOT Scour Engineer if this causes reevaluation of B.AP.03 Scour Vulnerability.

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.

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.

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 fascia during inspections 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 the channel protection is missing or is no longer effective as determined by a hydraulic review.

If no channel protection devices are present at the bridge, review plans and prior inspections for any channel protection requirements:

- If channel protection devices were never required, code N.
- If channel protection devices are required but missing, code 0.

History is retained for this item based on each Inspection Date (Item 90 | B.IE.03).

CONDITION RATING GUIDES FOR CHANNEL PROTECTION

N	**NOT APPLICABLE**	**Bridge does not cross over water or channel protection devices do not exist.** Vegetation is not considered installed channel protection.
9	**EXCELLENT**	**Isolated inherent defects.** (first inspection after installation) There are no noteworthy deficiencies that will affect the condition of the channel.
8	**VERY GOOD**	**Some inherent defects.** Banks are protected by installed channel protection device(s) which are performing as intended and are in stable condition.
7	**GOOD**	**Some minor defects.** Channel protection needs minor repairs. River control devices and embankment protection have isolated minor damages.
6	**SATISFACTORY**	**Widespread minor or isolated moderate defects.** River control devices and embankment protection have widespread minor defect or isolated moderate defect.
5	**FAIR**	**Some moderate defects; performance of the channel protection is not affected.** Bank protection is being lost. River control devices and/or embankment have major damage.
4	**POOR**	**Widespread moderate or isolated major defects; performance of channel protection is affected.** Bank and embankment protection is severely undermined. River control devices have severe damage.
3	**SERIOUS**	**Major defects; performance of channel protection is seriously affected. Condition typically necessitates more frequent monitoring or corrective actions.** Bank protection is no longer effective. River control devices are no longer present. Streambed aggradation, degradation or lateral movement has changed the waterway to now threaten the bridge and/or approach roadway.
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.**

B.C.11 Scour Condition Rating

*** NEW ITEM ***

Use the guidance from the Subscription Service memo until further guidance is finalized.
Contact IDOT Scour Engineer if this causes reevaluation of B.AP.03 Scour Vulnerability.

Report the scour condition that represents the observed or measured scour using one of the codes shown in the table below. The entire code description must be satisfied for the code to apply.
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).
Maintenance activities should be recorded on designated forms and reported to appropriate personnel in accordance with the policies of the maintaining agency.
History is retained for this item based on each Inspection Date (B.IE.03).

Number of Substructure Units from Item ID B.SB.02 = X.
Use the following guidance to evaluate the **scour severity** for each substructure unit:

Minor Scour	Foundations are not exposed or changed from as-built conditions.
Moderate Scour	Foundation exposed or changed from as-built conditions but depth less than the critical scour limit.
Major Scour	Foundation exposed and depth greater than the critical scour limit

Use the following guidance to evaluate the **scour extent** for the entire bridge:

Scour Severity	**Affected Substructure units.**	**Percentage**
None	A	A/X
Minor	B	B/X
Moderate	C	C/X
Major	D	D/X
Total Substructure Units	X	

Isolated	One instance of the defect.
Some	More than one instance but less than 30%
Widespread	More than 30%

	Stability of the bridge	Scour Extent	Scour Severity (Depth)	Foundations (Piers/Footings)
N	Not applicable	Not applicable	Not applicable	Not applicable
9	Not affected	None	No change	Not exposed
8	Not affected	Insignificant	Minimal change	Not exposed
7	Not affected	Some Minor	Minor (< 2 ft.)	Not exposed
6	Not affected	Widespread minor / Isolated moderate	>2 ft. but above critical scour limit	Partially exposed
5	Not affected	Moderate	Depth > 2 ft., but less than the critical scour limit	Moderately exposed
4	Affected	Widespread moderate / Isolated major	Depth greater than critical scour limit	Significantly exposed.
3	Seriously affected	Major	Complete loss of fill embankment and/or slope	Exposed and affecting structural capacity. Rotation, lateral translation, settling or buckling of substructure unit.
2	Severely compromised	Major	Extensive scour	Significant substructure support removed
1	Imminent Failure	Major	Channel rehabilitation	Failure of pier/abutment imminent
0	Failed	Major	Beyond corrective action.	Pier/abutment failed.

CONDITION RATING GUIDES FOR SCOUR

N	**NOT APPLICABLE**	**Bridge does not cross over water.**
9	**EXCELLENT**	**No scour.** Foundation conditions match as-built conditions with no change in support to the structure and no change of bank characteristics in the vicinity of the bridge. Typically, first inspection after installation.
8	**VERY GOOD**	**Insignificant scour.** Minimal changes to groundline are evident compared to as-built condition.
7	**GOOD**	**Some minor scour.** Bridge is beginning to exhibit signs of scour. Examples of minor scour include but are not limited to aggradation, degradation, lateral stream instability, loss of embankment, scour hole formation around substructure units. Foundations (piles and/or footings) are not exposed or have not changed from as-built conditions.
6	**SATISFACTORY**	**Widespread minor or isolated moderate scour.** Refer to examples of minor (7) and moderate (5) scour and consider the extent of each (isolated, some, or moderate).

5	**FAIR**	**Moderate scour; strength and stability of the bridge are not affected.** Examples of moderate scour include but are not limited to undermining of substructure unit, head-cutting, unstable banks, and loss of slope. Foundations (piles and/or footings) are exposed and have changed from as-built conditions but currently do not affect structural capacity.
4	**POOR**	**Widespread moderate or isolated major scour; strength and/or stability of the bridge is affected.** Refer to examples of moderate (5) and major (3) scour and consider the extent of each (isolated, some, or moderate).
3	**SERIOUS**	**Major scour; strength and/or stability of the bridge is seriously affected. Condition typically necessitates more frequent monitoring, load restrictions, and/or corrective actions.** Examples of major scour include but are not limited to rotation, lateral translation, settling and/or buckling of substructure unit, complete loss of fill embankment and/or slope. Foundations (piles and/or footings) are exposed, have changed from as-built conditions, and affect structural capacity. Notify the Bureau of Bridges and Structures to consider restrictions and remediation.
2	**CRITICAL**	**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.** Extensive scour has removed significant substructure support. Notify the Bureau of Bridges and Structures immediately to initiate restrictions and remediation. A special inspection for this item is required at intervals not to exceed 6 months.
1	**IMMINENT FAILURE**	**Bridge is closed to traffic due to scour condition. Channel rehabilitation may return the bridge to service.** Failure of piers/abutments is imminent. Close the bridge immediately and notify the Bureau of Bridges and Structures to initiate remediation.
0	**FAILED**	**Bridge is closed due to scour condition and is beyond corrective action. Bridge replacement is needed to restore service.**

B.C.12 Bridge Condition Classification

*** NEW ITEM ***

Calculated by FHWA – do not report.

Good (987), Fair (65), or Poor (43210) based on lowest of B.C.01 thru B.C.04 Condition Ratings (Deck, Super, Sub, Culvert).

B.C.13 Lowest Condition Rating Code

*** NEW ITEM ***

Calculated by FHWA – do not report.

Lowest of B.C.01 thru B.C.04 Condition Ratings (Deck, Super, Sub, Culvert).

B.C.14 NSTM Inspection Condition

IDOT Item 93A1 Fracture Critical Appraisal Rating

This item represents the condition of the Non-redundant Steel Tension Members (NSTM) identified to be inspected in the NSTM inspection procedures, and incorporated into the superstructure or substructure condition rating.

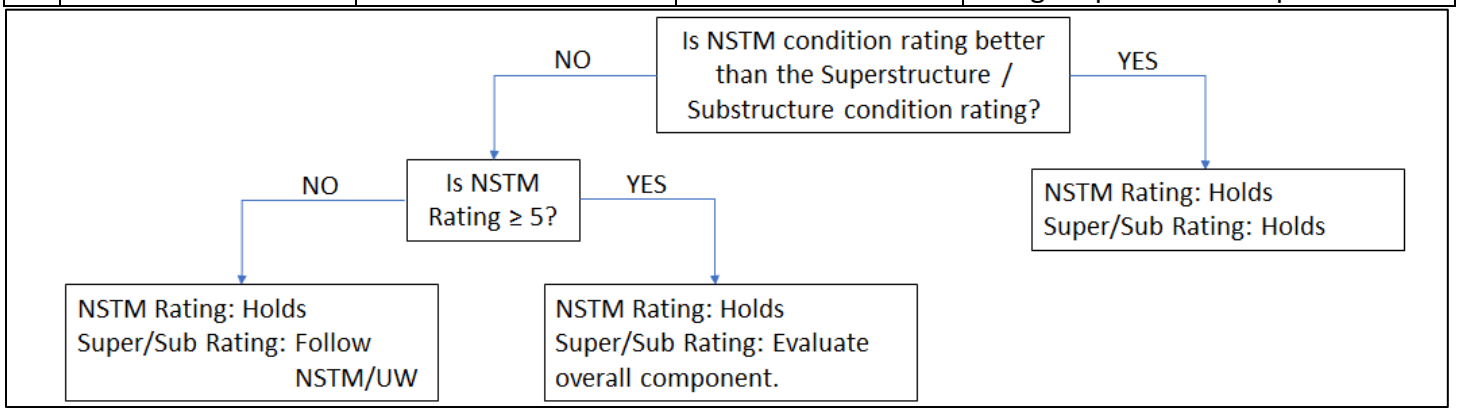
For a bridge with NSTM(s) in both the superstructure and substructure, report only the lower of the two condition values for the condition of the NSTM(s).

Do not report this item when Item B.IR.01 (NSTM Inspection Required) is N.

Needed repairs must be recorded on designated forms and reported to appropriate personnel in accordance with the policies of the maintenance agency.

History is retained for this item based on each Inspection Date. (Item 90 | B.IE.03).

	Cracking (Priority)	Rusting/Pitting/Other	Section Loss	Comments
9	No	No	No	(Only at first inspection)
8	No	No	No	
7	No	**Yes**, Some	No	
6	No	**Yes**, Minor	**< 2%**	
5	**Yes**, In secondary members.	**Yes**, Some moderate	**2% - 10%,** In critical areas	
4	**Yes**, Minor, in primary members	**Yes**, Widespread moderate	**10% - 30%,** In critical areas	
3	**Yes**, Major in primary member or extensive cracking.	**Yes**, Major	**30% - 50%,**	**Notify BBS .**Frequent monitoring, load restrictions and/or corrective action required.
2	**Yes**, Temp support required	**Yes**	**> 50 %**	**Notify BBS immediately.** Special inspection required, at least every 6 months.
1	**Yes**, Imminent Failure	**Yes**	**100%**	**Close Bridge and Notify BBS immediately.**
0	Failed	Failed	**100%**	Bridge replacement required



CONDITION RATING GUIDES FOR NSTM INSPECTION

N	**NOT APPLICABLE**	**NSTM Component does not exist.**
9	**EXCELLENT**	**Isolated inherent defects.** (first inspection after installation)
8	**VERY GOOD**	**Some inherent defects.** No cracks and no visible rust.
7	**GOOD**	**Some minor defects.** No cracks. Some rust may be present but without any section loss.
6	**SATISFACTORY**	**Widespread minor or isolated moderate defects.** Initial section loss (minor pitting, scaling, or flaking) up to 2% section loss.
5	**FAIR**	**Some moderate defects; strength and performance of the component are not affected.** Initial section loss up to 10% in critical areas, fatigue or out-of-plane bending cracks may be present in secondary members, arrested fatigue cracks and cracks parallel to the direction of stress may be present in primary members, hinges may be showing minor corrosion problems.
4	**POOR**	**Widespread moderate or isolated major defects; strength and/or performance of the component is affected.** Section loss up to 30% in critical area, fatigue or out-of-plane bending cracks may be present in primary members, previously arrested fatigue cracks propagating beyond arresting holes in primary members.
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.** Advanced section loss up to 50%, extensive perpendicular to stress fatigue or out of plane bending cracks in primary members. Notify the Bureau of Bridges and Structures to consider restrictions and remediation.
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 to service.** Severe section loss over 50% requires special inspections, temporary supports or repairs may be required to remain open to traffic. Notify the Bureau of Bridges and Structures immediately to initiate restrictions and remediation. A special inspection for this item is required at intervals not to exceed 6 months.
1	**IMMINENT FAILURE**	**Bridge is closed to traffic due to component condition. Repair or rehabilitation may return the bridge to service.** Close the bridge immediately and notify the Bureau of Bridges and Structures to initiate remediation.
0	**FAILED**	**Bridge is closed due to component condition, and is beyond corrective action. Replacement is required to restore service.**

B.C.15 Underwater Inspection Condition

IDOT Item 93B1 Underwater Appraisal Rating

Do not report if not required per B.IR.02 Underwater Inspection Required.

This item represents the condition of underwater members identified to be inspected in the underwater inspection procedures and incorporated into the substructure or culvert condition rating.

Per the FHWA Underwater Bridge Inspection Reference Manual, Item B.C.15 represents the condition of the underwater portion of a bridge substructure that is typically submerged and inaccessible during a routine inspection. Item B.C.03 represents the condition of the entire substructure; therefore, the underwater inspection condition is incorporated into the B.C.03 rating. The substructure condition can vary greatly between the below- and above-water portions. A bridge substructure may appear to be in good condition based on the routine inspection by topside personnel, but the B.C.03 condition rating may be lowered if the underwater inspection reports deterioration of the pier below the water.

If this item has previously been reported because an underwater inspection is generally required, it must 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 recur during the next inspection interval.

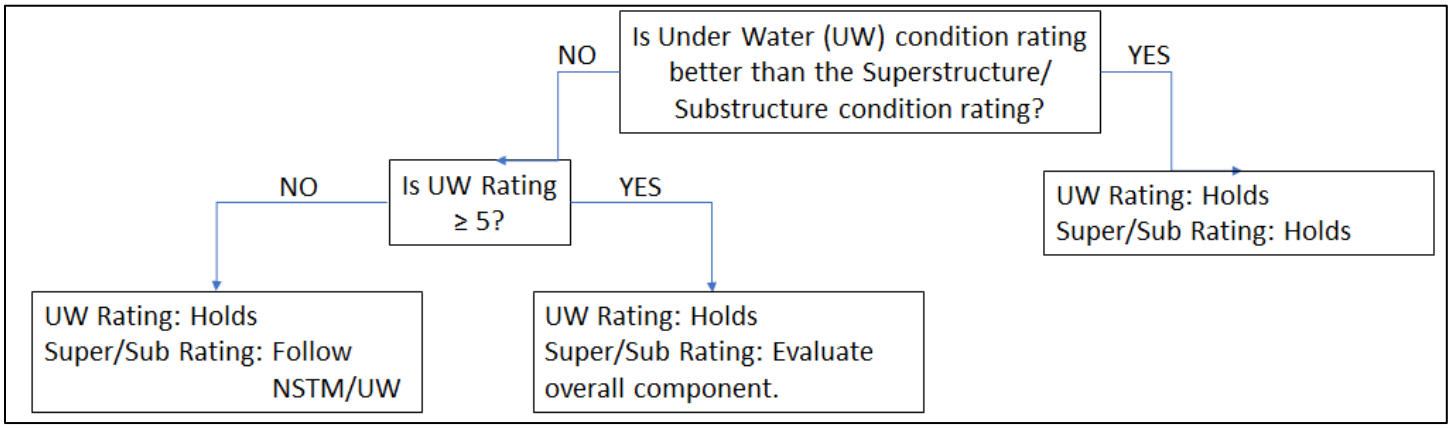
- i.e., if B.IR.03 Underwater Inspection Required = Y, then B.C.15 must be reported, regardless of water level at time of inspection.

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 or culvert.

Report the condition rating of the underwater members of the substructure or culvert based on the underwater inspection.

Do not report this item when Item B.IR.03 (Underwater Inspection Required) is N.

History is retained for this item based on each Inspection Date.



CONDITION RATING GUIDES FOR UNDERWATER INSPECTION

N	**NOT APPLICABLE**	**Underwater inspection not required.**
9	**EXCELLENT**	**Isolated inherent defects.** (first inspection after installation)
8	**VERY GOOD**	**Some inherent defects.** No problems noted.
7	**GOOD**	**Some minor defects.** Minor cracking, spalls, or scaling with few incidences of exposed reinforcement with only surface rust. Minor scour may have occurred at the foundation.
6	**SATISFACTORY**	**Widespread minor or isolated moderate defects.** Moderate deterioration, spalls, cracking or leaching in underwater units with up to 2% section loss. Moderate sedimentation or shallow, local scour may have occurred with exposure of the top of the pile supported footings, less than 2’ deep scour around pile bents.
5	**FAIR**	**Some moderate defects; strength and performance of the component are not affected.** Large portions of concrete or masonry units are spalled, scaled, or delaminated with exposed reinforcing steel up to 10% loss of concrete (horizontal cross section), up to 10% loss of reinforcement steel, extensive map cracking with leaching, spread footings with no undermining on soil and up to 5% undermining on rock, less than 2’ of exposed piles or seal coat below pile supported footings, less than 6’ deep scour around pile bents.
4	**POOR**	**Widespread moderate or isolated major defects; strength and/or performance of the component is affected.** Active cracks in concrete and masonry units that indicate a reduction in the substructure unit’s capacity to support the superstructure loads, up to 30% section loss of bearing seat(s) or pile(s), section loss of primary steel reinforcement up to 30%. Section loss of concrete up to 30%, undermining of spread footing which may be affecting the stability of the unit but no significant settlement has yet occurred, worse condition or combination of deterioration stated in condition rating “5”. Frequent monitoring is required; reduce the gap between inspection cycles.
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.** Section losses up to 50%, adjacent column ties are broken causing the vertical reinforcement to be ineffective, severe scour or undermining of footings affecting the stability of the unit with some settlement of the substructure. Notify the Bureau of Bridges and Structures to consider restrictions and remediation.

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.** Conditions worse than condition rating of "3", section loss greater than 50%, special inspection is required to allow bridge to remain open, measurable lateral or vertical movement, unstable structures. The Bureau of Bridges and Structures shall be notified immediately. Notify the Bureau of Bridges and Structures immediately to initiate restrictions and remediation. A special inspection for this item is required at intervals not to exceed 6 months.
1	**IMMINENT FAILURE**	**Bridge is closed to traffic due to component condition. Repair or rehabilitation may return the bridge to service.** Close the bridge immediately and notify the Bureau of Bridges and Structures to initiate remediation.
0	**FAILED**	**Bridge is closed due to component condition, and is beyond corrective action. Replacement is required to restore service.**

SNBI SUBSECTION 7.2 ELEMENT IDENTIFICATION
SNBI SUBSECTION 7.3: ELEMENT CONDITIONS

7.2 Element Identification	
B.E.01	Element Number
B.E.02	Element Parent Number
B.E.03	Element Total Quantity
7.3 Element Conditions	
B.CS.01	Element Quantity CS1
B.CS.02	Element Quantity CS2
B.CS.03	Element Quantity CS3
B.CS.04	Element Quantity CS4

The only changes with SNBI are the Item IDs (B.E.# and B.CS.#), which are handled in the software.

SNBI SUBSECTION 7.4: APPRAISAL

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

B.AP.01 Approach Roadway Alignment

Existing Bridges: Coding Guide Item 72 Approach Roadway Alignment

- Item 72 = 7, 8, 9 → G Good
- Item 72 = 5, 6 → F Fair
- Item 72 = 0, 1, 2, 3, 4 → P Poor

B.AP.02 Overtopping Likelihood

Existing Bridges: Coding Guide, Item 71 Waterway Adequacy, Item 26 Functional Class:

CG Item 71	CG Item 26	SNBI Value	SNBI Description
0	any value	HVH-T	TEMP - High to very high - 5 or 6
2	any value	HVH-T	TEMP - High to very high - 5 or 6
3	01, 11, or 12	1	Remote – once every 100 years or less frequently
	08, 09, or 19	6	Very High - once every 2 years or more frequently
	any other value	5	High - once every 3-10 years
4	08, 09, or 19	5	High - once every 3-10 years
	any other value	1	Remote – once every 100 years or less frequently
5	any value	1	Remote – once every 100 years or less frequently
6	08, 09, or 19	1	Remote – once every 100 years or less frequently
	any other value	VLM-T	TEMP - Very low to moderate - 2 or 3 or 4
7	any value	VLM-T	TEMP - Very low to moderate - 2 or 3 or 4
8 or 9	any value	1	Remote – once every 100 years or less frequently
N	any value	DNR	Bridge does not cross over a waterway
Additional SNBI Codes		0	Never
Additional SNBI Codes		2	Very low - once every 51 to 99 years
Additional SNBI Codes		3	Low - once every 26 to 50 years
Additional SNBI Codes		4	Moderate - once every 11 to 25 years
DNR = Do Not Report, T = Temp HVH = High to Very High, VLM = Very Low to Moderate			

See scour assessment for any discussion of overtopping likelihood.

Do Not Report for bridges without a W## Feature.

Check for debris in the superstructure, mashed vegetation at the approaches, historical reports, etc. as evidence of overtopping to make an educated guess on the temporary codes.

B.AP.03 Scour Vulnerability

NOTE: THIS ITEM WILL BE POPULATED BY BBS SCOUR STAFF ONLY.

Existing Bridges:

- Coding Guide Item 113 Scour Critical Bridges
- Illinois item 113A Scour Critical Analysis Date
- Illinois item 113B Scour Critical Evaluation Method
- Illinois item 113C Scour Critical Analysis By
- Illinois item 113D Scour Critical Remarks

The SNBI codes break down into categories: appraised or not, scour critical or not, stable or not, and whether the countermeasures are designed and functioning or not:

APPRAISED	CODE	CRITICAL	STABLE FOR SCOUR	COUNTERMEASURES
YES	**A**	not SC	stable	not required
	B	not SC	stable	required, designed, and functioning
	C	SC	could become unstable	temporary (not designed) installed to mitigate
	D	SC	is or may become unstable	
NO	**0**	unknown	not completed	
	E	unknown	temporary (not designed) countermeasure installed to mitigate scour	
	U	unknown	unknown foundations	

See scour assessment.
Do Not Report for bridges without a W## Feature.
CG Item 113=8 translates to A or B, depending on countermeasures. If no countermeasures are present, and none are noted as required or missing, then report A.
Countermeasure effectiveness depends on intent of countermeasure (FHWA is developing clarification).

B.AP.04 Scour Plan of Action

NOTE: THIS ITEM WILL BE POPULATED BY BBS SCOUR STAFF ONLY.

*** NEW ITEM ***
See scour assessment.
Do Not Report for bridges without a W## Feature.
The SNBI codes break down into categories: required or not, and implemented or not:

CODE	POA REQUIRED	POA IMPLEMENTED
0	No	n/a
N	Yes	No
Y	Yes	Yes

B.AP.05 Seismic Vulnerability

*** NEW ITEM ***

Use design plans and calculations with field evaluation to determine.
Report 0 if not known.

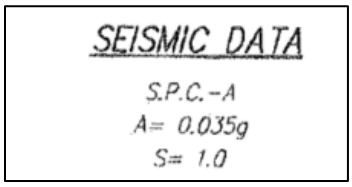
Design provides the seismic evaluation, and inspection assesses the retrofit condition (codes B, C, D):

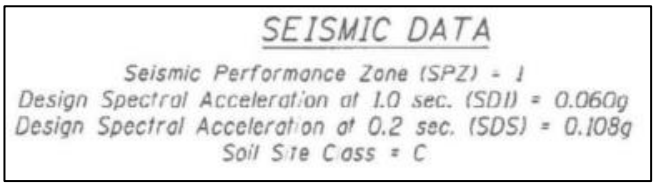
EVALUATION	CODE	RETROFIT
Completed	**A**	not needed
	B	needed, in place
	C	needed, partial in place
	D	needed, missing
not completed	**0**	n/a
not required	**N**	n/a

Dates:

- AASHTO published the Guide Specification for Seismic Design of Highway Bridges in 1983.
- IDOT began requiring seismic evaluation in 1989 for state bridges, later for non-state bridges.
- For un-retrofitted bridges designed before 1983, report either 0 NOT COMPLETED or N NOT REQUIRED
- For un-retrofitted bridges designed 1983-1989, report either 0 or N unless plans show evaluation.
- For bridges designed after 1989, report A, B, C, or D.

Codes A, B, C, and D require evidence of seismic evaluation. Calculations or plans will show seismic info:

- 



- Terminology has changed over time: SPC (Seismic Performance Category, A to D) and SPZ (Seismic Performance Zone, 1 to 4) each align with Seismic Design Category (SDC A to D) as described below.

Codes 0 and N require knowledge of whether seismic evaluation was required. Consider the structure type (culvert, single-, or multi-span) and Seismic Design Category (SDC, based on location and soil site class) to determine the requirement for evaluation. See the 2024 IDOT Seismic Manual (SM) for more information.

Structure Type:

- Culverts and single span bridges DO NOT REQUIRE seismic design, regardless of location (SM 1.2.4).
- Seismic design and detailing ARE required for all multi-span bridges in SDC B, C, and D (SM 1.2.2).

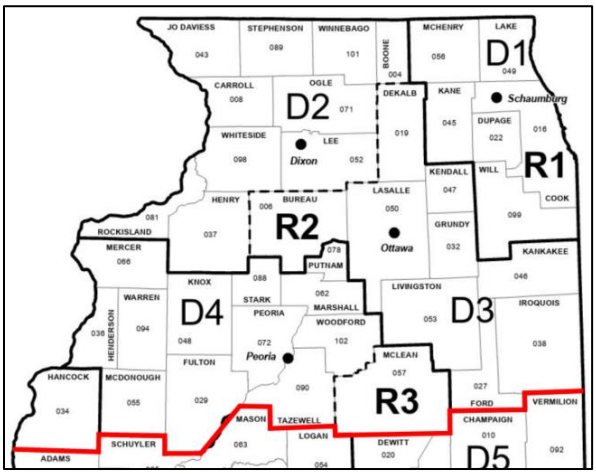
Seismic Design Category:

- There are 4 seismic design categories (A, B, C, D) whose geographical boundaries between vary depending on soils at the bridge (SM 3.5).
    - Seismic effect is lowest in the north of Illinois (SDC A) and highest in the south (SDC D).

- There are 9 soil site classes (A, B, BC, C, CD, D, DE, E, F) based on how intensely an earthquake is transmitted thru the strata (AASHTO Table 3.10.3.1-1):

A	Hard rock	
B	Medium hard rock	
BC	Soft Rock	
C	Very dense sand or hard clay	
CD	Dense sand or very stiff clay	
D	Medium dense sand or stiff clay	assume this site class if soil information is unavailable
DE	Loose sand or medium stiff clay	
E	Very loose sand or soft clay	do not use unless supported by data
F	Soils requiring site-specific ground response evaluations	do not use unless supported by data, no map given

- Therefore, SDC is shown in 8 different maps (SM Figures 3.5-1 to 3.5-8):
  - 

- Structures in SDC A do not require seismic design but may require minimal seismic detailing (SM 1.2.1).
  - Report N NOT REQUIRED for bridges located north of the red line in the map below – this includes all of Districts 1, 2, 3, and 4, plus Hancock and McClean Counties:
  - 

SNBI SUBSECTION 7.5: WORK EVENTS

7.5 Work Events	
B.W.01	Year Built
B.W.02	Year Work Performed
B.W.03	Work Performed

B.W.01 Year Built

Existing Bridges: Coding Guide Item 27 Year Built

When Work Performed in the Work Events dataset is equal to "BR1" meaning the bridge has been replaced, no other work types should be reported in that Work Event dataset.

B.W.02 Year Work Performed

B.W.03 Work Performed

Existing Bridges: some data exists but needs manipulation to transfer

- If Coding Guide Item 106 Year Reconstructed is populated, use it to report that year's event.

Broad Categories are Replacement, Improvement, Rehabilitation, and Preservation.
Routine maintenance is not reported: drain cleaning, pothole patching, rail patches, etc.
Work is not tied to an inspection.

Requirements for reporting:

- FHWA expects an entry for each calendar year.
- If no work is reported, leave blank – the submittal process will automate the entry of B.W.03 = 0.
- FHWA does not require the reporting of work performed before 2025.

Common work to report:

- Deck Overlay: report DK4 (or if work exposes the top mat of rebar, report DK2 or DK3 based on %)
- Superstructure Paint: report SP6 (new or replaced) or SP7 (preserved)
- Joints: report JT1 (installed or replaced) or JT2 (repaired)
- Widening: IP1
- Rehabilitation – replacement, major, or minor
  - Level 1 (DK1, SP1, SB1) is replacement of the entire component
  - Level 2 (DK2, SP2, SB2, CU2) is major, meaning more than 25% and less than all of the component
  - Level 3 (DK3, SP3, SB3, CU3) is minor, meaning no more than 25% of the component

APPENDICES

- APPENDIX A – RAIL GUIDANCE for B.RH.01 and 02
- APPENDIX B – DETOUR DETERMINATION for B.H.17
- APPENDIX C – E/E' FATIGUE DETAIL CATEGORIES for B.IR.02

APPENDIX A – RAIL GUIDANCE for B.RH.01 and 02

2011 AASHTO Roadside Design Guide

- https://www.scribd.com/document/387124543/AASHTO-Roadside-Design-Guide-4th-ed-2011-pdf
- Chapter 7, pdf pages 136-151: Bridge Railings and Transitions
- AASHTO-AGC-ARTBA Joint Committee Task Force 13: All new and existing bridge railings can be found in the TF13 Bridge Rail Guide at https://tf13.org. Task Force 13 is now an independent association, but it was previously part of a Joint Committee established in 1972 that united AASHTO, ARTBA, and Associated General Contractors of America (AGC) committees.

Type: Curb Type Glu-Lam Timber Railing
Source: 2011 AASHTO Roadside Design Guide Fig 7-1
Code: 3501

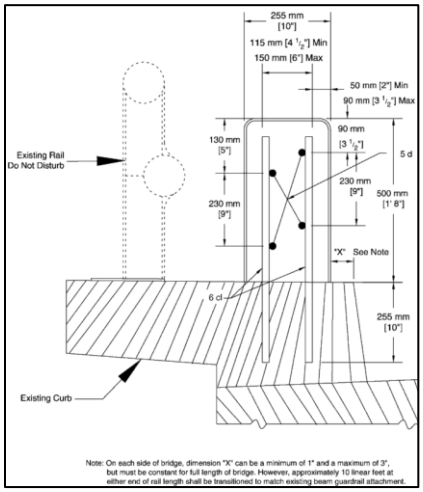
Type: Wyoming Two-Tube Bridge Railing
Source: 2011 AASHTO Roadside Design Guide Fig 7-3
Code: 3503

Type: Texas T-6 Railing
Source: 2011 AASHTO Roadside Design Guide Fig 7-2
Code: 3502

Type: Concrete F-Shaped Bridge Railing
Source: 2011 AASHTO Roadside Design Guide Fig 7-4
Code: 3504

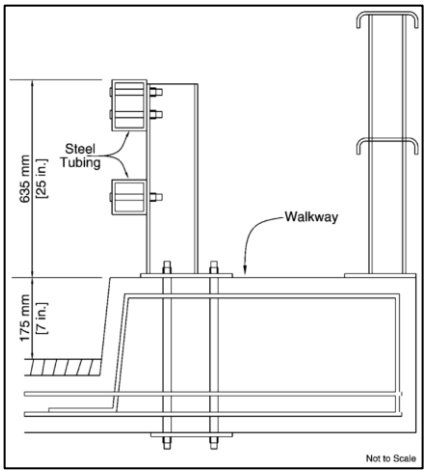
Type: 42” Tall Concrete Safety-Shaped Bridge Railing
Source: 2011 AASHTO Roadside Design Guide Fig 7-5
Code: M095

Type: Texas Type TT Railing
Source: 2011 AASHTO Roadside Design Guide Fig 7-6
Code: M096



Type: Iowa Concrete Block **Retrofit** Bridge Railing
Source: 2011 AASHTO Roadside Design Guide Fig 7-9
Code: 3504

Type: Delaware Thrie-Beam **Retrofit**
Source: 2011 AASHTO Roadside Design Guide Fig 7-10
Code: 3504



Type: Metal Post-and-Beam **Retrofit**
Source: 2011 AASHTO Roadside Design Guide Fig 7-11
Code: 3504

Type: Thrie-Beam Transition to Modified Concrete Safety Shape
Source: 2011 AASHTO Roadside Design Guide Fig 7-12
Code: 3503

Task Force 13

https://tf13.org/bridge-rails-browse-search/ has a searchable database of 139 railings with images:

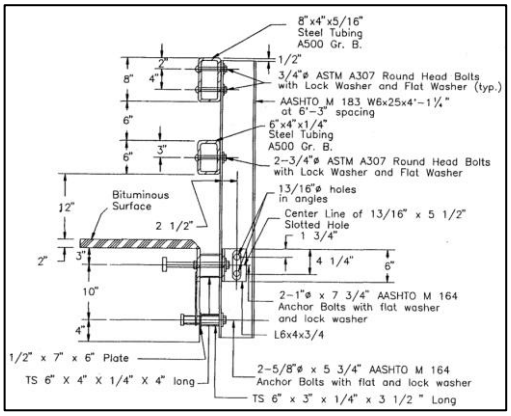
- Test Specs: AASHTO Guide Spec for Bridge Railings, MASH 2009, MASH 2016, NCHRP Report 350
- Materials: Aluminum, CIP RC, Precast Concrete, Steel Tube/Box, Thrie-Beam, W-Beam, Wood, Other
- Mounting Types: Box Culvert, Curb/Sidewalk, Deck, Parapet, Side, Steel Floor Beam
- Deck Types: Conventional RC, FRP Composite, Longitudinal/Transverse Glue-Lam Wood, Wood, Other

Designator and Name	Image	Material	Test Specification	Test Level	Perm/Temp	Mounting Type	Deck Type	Aesthetic	See-Thru	Retrofit	Combo	Contact
Search		Any	Any	Any	Any	Any	Any	Any	Any	Any	Any	Search
SBA02b Foothills Parkway Bridge Railing		Aluminum (A)	AASHTO Guide Spec for Bridge Railings	TL-2	Permanent	Parapet	Conventional Reinforced Concrete	Yes	Yes	No	No	Valentine & Company
SBA03b		Aluminum (A)	AASHTO Guide Spec	TL-2	Permanent	Parapet	Other	Yes	Yes	No	No	North Carolina DOT

NC Two-Bar Metal Bridge Rail

IL 2399

OH Type 5 Nested W-Beam/Tubular Culvert Rail



Illinois Side Mounted Steel Railing

Tacoma Narrows Bridge

https://tf13.org/transition-system-search/ has a searchable database of 22 transitions with images:

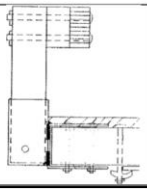
#	Designator and Name	Designator and Name	Type	System 1	System 2	Test Specification	Test Level	Perm/Temp	Contact
2	STB10	Glulam Bridge Rail Transition, TL-2	Bridge Rail-to-Guardrail (B)	W-Beam Guardrail	Timber Bridge Railing	NCHRP Report 350	TL-2	Permanent	Midwest Roadside Safety Facility
4	STB11	Glulam Bridge Rail Transition, TL-4	Bridge Rail-to-Guardrail (B)	Thrie-Beam Guardrail	Timber Bridge Railing	NCHRP Report 350	TL-4	Permanent	Midwest Roadside Safety Facility
6	STB12	Thrie-Beam Transition to NJ-Shape Concrete	Bridge Rail-to-Guardrail (B)	Thrie-Beam Guardrail	NJ-Shape Concrete Bridge Railing	AASHTO MASH 2016	TL-3	Permanent	Midwest Roadside Safety Facility
8	STB13	Modified Hawaii Thrie-Beam Approach Guardrail Transition	Bridge Rail-to-Guardrail (B)	MGS W-Beam Guardrail	Vertical Concrete Bridge Railing	AASHTO MASH 2016	TL-3	Permanent	Hawaii Department of Transportation
10	STB14	Alaska MASH 2-Tube Bridge Rail Transition	Bridge Rail-to-Guardrail (B)	MGS W-Beam Guardrail	Steel 2-Tube Bridge Railing	AASHTO MASH 2016	TL-3	Permanent	Alaska Department of Transportation
12	STB15a	Long Span Structure Connection	Bridge Rail-to-Guardrail (B)	Thrie-Beam Guardrail	Vertical Concrete Bridge Railing	AASHTO MASH 2016	TL-3	Both	Northern Infrastructure Products
14	STC01	Three Cable Low-Tension Transition to BCT End Terminal	Cable Barrier-to-Guardrail (C)	Cable Barrier	BCT Terminal	NCHRP Report 350	TL-3	Permanent	Midwest Roadside Safety Facility
16	STG02	MGS W-Beam to Thrie-Beam Transition	Guardrail-to-Guardrail (G)	MGS W-Beam Guardrail	Thrie-Beam Guardrail	NCHRP Report 350	TL-3	Permanent	Midwest Roadside Safety Facility
18	STG03a	Transition from Steel-Post MGS to Thrie-Beam Approach Guardrail	Guardrail-to-Guardrail (G)	MGS W-Beam Guardrail	Thrie-Beam Guardrail	AASHTO MASH 2016	TL-3	Permanent	Midwest Roadside Safety Facility
20	STG03b	Transition from Wood-Post MGS to Thrie-Beam Approach Guardrail	Guardrail-to-Guardrail (G)	MGS W-Beam Guardrail	Thrie-Beam Guardrail	AASHTO MASH 2016	TL-3	Permanent	Midwest Roadside Safety Facility
22	STG04a	Nested MGS W-Beam to Thrie-Beam Transition with Curb, Steel Posts	Guardrail-to-Guardrail (G)	MGS W-Beam Guardrail	Thrie-Beam Guardrail	AASHTO MASH 2016	TL-3	Permanent	Midwest Roadside Safety Facility
24	STG04b	Nested MGS W-Beam to Thrie-Beam Transition with Curb, Wood Posts	Guardrail-to-Guardrail (G)	MGS W-Beam Guardrail	Thrie-Beam Guardrail	AASHTO MASH 2016	TL-3	Permanent	Midwest Roadside Safety Facility
26	STG05	Midwest Guardrail System (MGS) to PCB	Guardrail-to-Guardrail (G)	MGS W-Beam Guardrail	Portable F-Shape Concrete	AASHTO MASH 2016	TL-3	Permanent	Midwest Roadside Safety Facility
28	STG06	Metal Transition for Branching Concrete Barrier	Guardrail-to-Guardrail (G)	Permanent NJ-Shape Concrete	Portable F-Shape Concrete	AASHTO MASH 2016	TL-3	Temporary	Northern Infrastructure Products
30	STG07	Safety Roller Barrier Transition to W-Beam	Guardrail-to-Guardrail (G)	Safety Roller Barrier	W-Beam Guardrail	AASHTO MASH 2016	TL-3	Permanent	KSI Global Australia Pty Ltd
32	STG08a	QuickChange Moveable Barrier-Concrete Reactive-Tension System Transition	Guardrail-to-Guardrail (G)	QuickChange Moveable Barrier-Concrete Reactive-Tension	Fixed Concrete Barrier	AASHTO MASH 2016	TL-3	Both	Lindsay Transportation Solutions
34	STG08b	QuickChange Moveable Barrier Concrete Reactive-Tension System - Fiber Barrier Transition	Guardrail-to-Guardrail (G)	QuickChange Moveable Barrier Concrete Reactive-Tension System - Fiber Series	Fixed Concrete Barrier	AASHTO MASH 2016	TL-3	Both	Lindsay Transportation Solutions
36	STG09	BG800 to HighwayGuard LDS Transition	Guardrail-to-Guardrail (G)	BG800 Steel Barrier	HighwayGuard LDS	AASHTO MASH 2016	TL-3	Temporary	Highway Care Ltd.
38	STG10	ETI USA Thrie-Beam to ETI Roller Barrier	Guardrail-to-Guardrail (G)	ETI USA Thrie-Beam	ETI Roller Barrier	AASHTO MASH 2016	TL-3	Permanent	ETI USA, Inc.
40	STG11a	Weak-Post to Strong-Post W-Beam Guardrail Transition	Guardrail-to-Guardrail (G)	W-Beam Guardrail	W-Beam Guardrail	AASHTO MASH 2016	TL-3	Permanent	Texas A&M Transportation Institute
42	STR01	HV2 Barrier Transition to Crash Cushion	Crash Cushion-to-Guardrail (R)	HV2 Barrier	Crash Cushion	AASHTO MASH 2016	TL-3	Both	Saferoads Pty Ltd
44	STR02	SafeZone to SLED Transition	Crash Cushion-to-Guardrail (R)	SafeZone Steel Barrier	SLED Terminal	AASHTO MASH 2016	TL-3	Temporary	Laura Metaal Road Safety

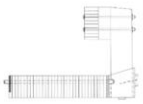
2023 FHWA Guide for Bridge Curb/Rail and Approach Treatment for Extremely Low Volume Roads

https://highways.dot.gov/sites/fhwa.dot.gov/files/bridge-curb-railing-approach-treatment-final-guide.pdf

- Appendix A, pdf page 28: Crash Tested Bridge Rail Designs
- Appendix B, pdf page 73: Crash Tested Bridge Rail Terminal Designs
- Appendix C, pdf page 92: Crash Tested Transition Designs

Appendix A. Crash Tested Bridge Rail Designs

System Name	Test Number	Test Level	Photo/Sketch	Deck		Rail			Ref
				Type	Thick (in)	Type	Mount	Height (in)	
West Virginia Curb-Type Bridge Rail	WVBR-1	MASH TL-1		Nail laminated timber	5.50	Curb-type timber post and beam.	Bolted through rail, post, & deck, nut secured under deck.	19.75	1
Timber Curb-Type Bridge Railing for Low Volume Roads	CTBR-1	R350 TL-1		2" Bituminous wearing surface on top of longitudinal glulam timber	10.75	Single glulam timber post and timber beam.	Top bolted through top of rail, post, & deck with (4) 3/4"Ø A307 bolts.	17.75	2
Timber Bridge Rail System One	7212-4 7212-5	PL-1		2" wearing surface on top of Glulam timber	6.75	Glulam rail, timber block, and timber post.	Post seated in steel bracket, bracket bolted to u-shape fastener with (4) 3/8"x2.5"L fillet welds, u-shape fastener bolted to top/bottom of bridge deck with (4) ¾"Ø A325 bolts.	27.00	3

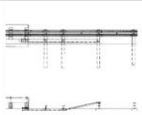
System Name	Test Number	Test Level	Photo/Sketch	Deck		Rail			Ref
				Type	Thick (in)	Type	Mount	Height (in)	
Wood System – Bridge Railing	WRPB-1	R350 TL-2		2" concrete wearing surface on top of transverse glulam timber	5.125	Single glulam timber rail, timber blockout, and timber posts.	Angle brackets bolted through top/bottom of the timber portion of the bridge deck with (6) 7/8"Ø bolts.	28.40	4
TxDOT T631 Bridge Rail	490023-6-1a 490023-6-2	MASH TL-2		Concrete (4000 psi)	8.00	W-beam attached to steel posts.	Base plate bolted through bridge deck with (4) 5/8"Ø 10"L A325 bolts.	31.00	5
Single Longitudinal Glulam Bridge Railing (Shoe-Box System)	FSSB-1 FSSB-2	PL-1		Glulam timber	10.75	Single glulam rail attached to sawn timber blockout and timber post.	Post seated in metal "shoe-box" and tacked with 6"L nail spike. Shoe-box through bolted into bridge deck with (2) 1"Ø x 48"L A722 high-strength threaded rods.	32.00	6

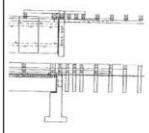
System Name	Test Number	Test Level	Photo/Sketch	Deck		Rail			Ref
				Type	Thick (in)	Type	Mount	Height (in)	
Low-Cost, Energy Absorbing Bridge Rail	MGSBR-1 MGSBR-2	MASH TL-3		4000 psi concrete	8.00	W-beam rail attached to steel posts with back-up plates.	Side mounted using a weak post assembly through bolted (top-bottom) with 1"Ø bolt.	31.00	7
Square-Shape Timber Curb Rail	LVCS-4	R350 TL-1		2" Bituminous wearing surface on top of longitudinal glulam timber	10.75	Single timber beam and timber post.	Top bolted through top of rail, post, & deck with (2) 5/8"Ø A307 bolts.	12.00	8
Modified 12-inch bridge rail for plank deck				4" x 12" Timber Planks	3.50	Curb-type timber post and beam.	Bolted through rail, post, & deck, nut secured under deck.	12.00	9
Modified 19.75-inch bridge rail for plank deck		MASH TL-1		4" x 12" Timber Planks	3.50	Curb-type timber post and beam.	Bolted through rail, post, & deck, nut secured through 4" x 12" stiffener plate under deck.	19.75	10

Appendix B. Crash Tested Bridge Rail Terminal Designs

System Name	Test Number	Test Level	Photo/Sketch	Downstream Connection	Terminal			Ref
					Type	End	Height (in)	
Vermont G1-d W-beam Terminal	47380-2 47380-3 47380-4	R350 TL-2		W-beam / W-beam transition	W-beam rail with steel blocks and steel posts	W-beam radius with buffer end (Radius=15.75')	27.00	1
NETC-MELT Guardrail End Terminal	400401-1 400401-2	R350 TL-2		W-beam / W-beam transition	W-beam rail with wood blocks and wood posts	Flared W-beam with buffer end (Flare=4')	27.00	2
Steel Backed Timber Guardrail Tangent End Terminal	09005 09006 09008 09009	R350 TL-2		Steel Backed Timber Barrier	Timber rail with timber blocks and timber breakaway posts in steel tubes	90-degree blunt end of timber rail and post	27.00	3

Appendix C. Crash Tested Transition Designs

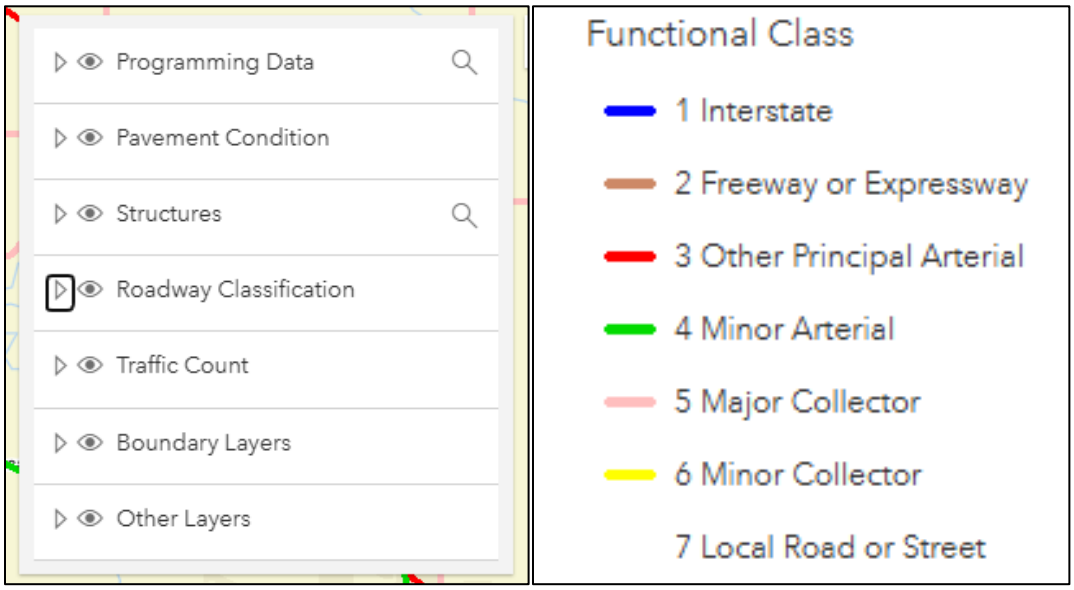
System Name	Test Number	Test Level	Photo/Sketch	Guardrail	Transition			Bridge Rail	Ref
				Type	Type	Post	Connection	Type	
Steel System Approach Guardrail Transition	STCR-2	R350 TL-2		27.78" tall standard w-beam guardrail.	Symmetrical transition section to 12'6" thrie beam section.	Seven steel posts with wood blockouts installed @ 37.5" spacing embedded 49"-54" deep.	Typical thrie-to-thrie beam splice using (12) 5/8"Ø bolts and cap rail transition using (2) 5/8"Ø bolts.	31.65" tall thrie beam with steel channel cap rail.	1
Wood System Approach Guardrail Transition	WRBP-2	R350 TL-2		27.78" tall standard w-beam guardrail.	W-beam guardrail (reduced post spacing) to nested w-beam guardrail.	Seven steel posts with wood blockouts installed @ 37.5" spacing embedded 43"-55" deep.	W-beam terminal connector and transition splice plate with (8) 7/8"Ø A307 bolts.	28.4" tall glulam timber bridge rail.	2
W-Beam Retrofit Transition	472070-3 472070-4	R350 TL-2		27" tall standard w-beam guardrail - G4(1S).	Nested w-beam guardrail with steel channel rub rail.	Three steel posts with steel blockouts installed with (2) @ 37.5" spacing and (1) @ 6'3" spacing embedded 50" deep.	Typical w-to-w beam splice using (8) 5/8"Ø bolts and rub rail using (2) 5/8"Ø bolts and (4) 7/8"Ø DFS wedge anchors.	29" tall w-beam retrofit bridge rail, supported by wood posts, and backed by concrete rail	3

System Name	Test Number	Test Level	Photo/Sketch	Guardrail	Transition			Bridge Rail	Ref
				Type	Type	Post	Connection	Type	
West Virginia Timber Bridge Rail Transition (Timber Bridge Rail System 2)	7212-3	AASHTO PL-1		None installed, report assumed 6'3" post spacing on standard guardrail section.	Glulam rail with timber rub rail. Glulam stiffening rail installed on last 4 posts of transition and first 2 bridge rail posts.	Ten wood posts with wood blocks installed with (4) @18.75" spacing, (4) @37.5" spacing and (1) @6'3" spacing embedded 44" deep.	Glulam transition-bridge rail spliced using (4) 7/8"Ø bolts through transition rail, block, post, and stiffening rail. Rub rail splice using (2) 5/8"Ø bolts and bolted to the deck using (4) 7/8"Ø bolts.	27" tall w-beam over steel tubes with timber blocks and posts seated in a steel bracket.	4

APPENDIX B – DETOUR DETERMINATION for B.H.17

How to Figure a Detour Route

Using roadway classification – use same or similar/higher for detour as the original route.

1) Use the Functional Class map to see which routes to use: https://webapps.dot.illinois.gov/iroads/
   a) Use the Structures layer to find the bridge.
   b) The Roadway Classification / Functional Class layer shows the hierarchy of route classes:
      i) 

   c) Take note of the functional class of the routes and zoom out until options appear around the bridge on same/similar class routes.
2) Use Google Maps to set the path and detour and to measure the mileage. https://www.google.com/maps
   a) From one end of the bridge, back up to the point of intersection of a same/similar class road – the point where a driver must decide, the decision point.
   b) Do the same past the other end of the bridge. These are the from and to points.
   c) Measure the direct route across the bridge.
   d) Drag the route away from the bridge to the chosen path and measure that.
   e) Subtract the original from the detour to get the SNBI value, rounded conventionally.
   f) DOCUMENT THE ROUTES WITH SCREEN CAPTURES.
3) Do this for each Highway Feature on and under the bridge.
   a) A bridge will always have at least one on route.
   b) A bridge may have more than one on-route if ramps or divided routes cross the bridge.
   c) A bridge might not have an under route if it only crosses water.
   d) Sometimes the detour is the same in each direction (NB vs SB, or EB vs WB), but sometimes it's not.
4) No routing needed for these, but still show a screen capture of the situation from google maps:
   a) 999 = no detour = dead end, no outlet
   b) 0 = ground level bypass = diamond interchange where ramping off and back on is possible
   c) 1 = twin bridges carry the on route not at an interchange; assumes a median cross-over can be constructed fairly quickly; think tanks in times of national emergency

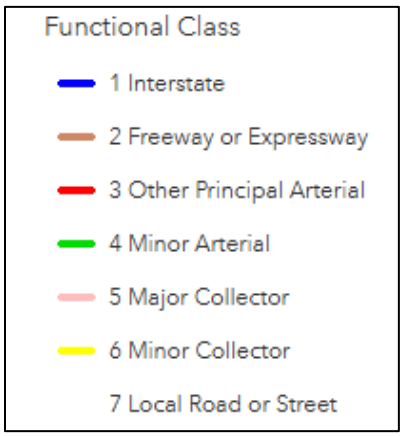
Example Detour Calculation

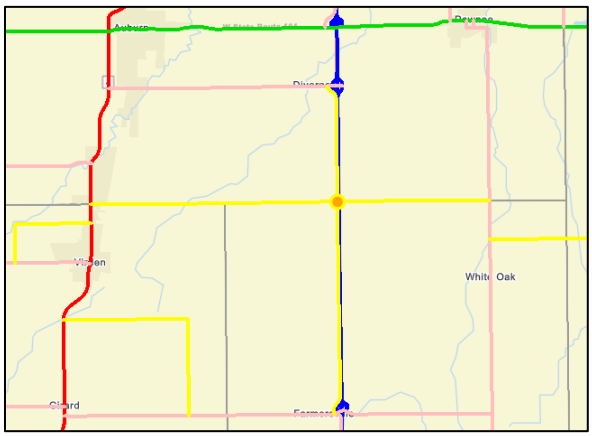
068-0105 carries Montgomery Road over I-55 and a frontage road. Lat/Long = 39.524020528, - 89.646079320.

- H01 = E/W Montgomery Road
- H02 and H03 = I-55 NB and SB, respectively
- H04 = Reichart Road, W Frontage Road

Google Maps link: https://maps.app.goo.gl/3cfYNRqnnchQJkmy5

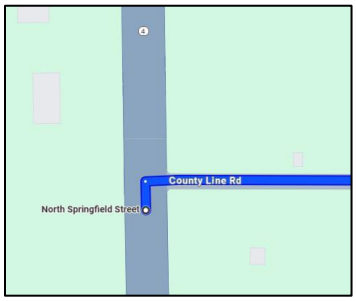
IROADS link: https://webapps.dot.illinois.gov/IROADS/?sn=0680105

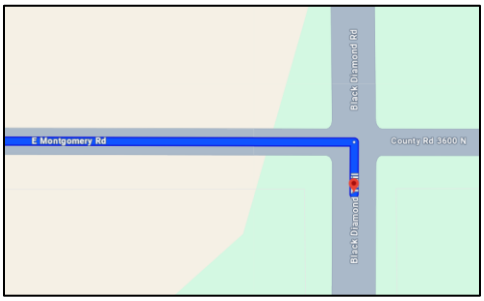




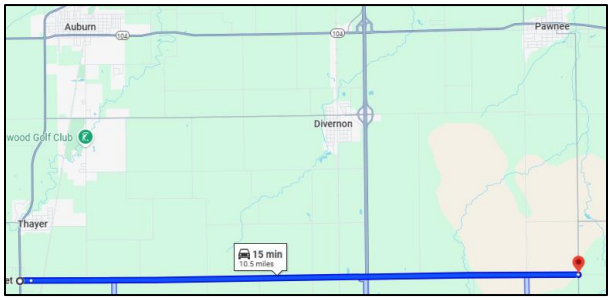
ON-ROUTE H01 = County Road 3600 North, aka Montgomery Road, running East-West

1) The Functional Class map shows the route is yellow = 6 Minor Collector.
2) Staying on similar class routes, the West decision point is at SR-4 between Thayer and Virden, and the East decision point is at Black Diamond Road between Pawnee and White Oak.
   a)





3) With Google Maps, set the “from” Point A just before the intersection of SR-4 and County Line Road
4) Set the “to” Point B just past the intersection with Black Diamond Road.
5) Measure this distance as 10.5 miles: https://maps.app.goo.gl/ggimdM29s9zL2p6R6
6) Drag the route to the detour – going North thru Auburn and Pawnee is shorter than going South thru Farmersville, so go North = 19.3 miles: https://maps.app.goo.gl/oKLvcYmwhKKCWtKc8
7) Detour length = 19.3 minus 10.5 = 8.8 miles, rounded conventionally to 9 miles.



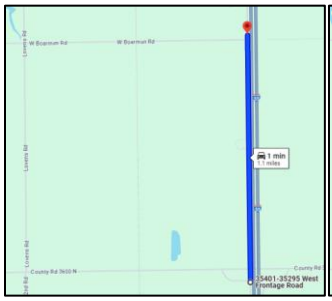
UNDER ROUTES H02 and H03 – I-55 NB and SB

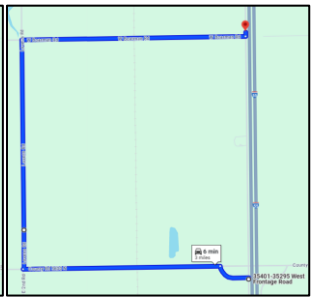
1) The Functional Class map shows the route is blue = 1 Interstate.
2) Zooming out and staying on interstate-class routes, the detour is St Louis to Effingham to Champaign to Decatur to Springfield.
3) The South decision point is at I-70 east of St Louis. The North decision point is at I-72 south of Springfield.
4) Original route = 74 miles from I-55 from I-70 to I-72: https://maps.app.goo.gl/mLjTUB1BLy2cNgJ58
5) Detour route = 240 miles on I-70, I-57, and I-72: https://maps.app.goo.gl/szNF8eodjMeUK54q7
6) Detour length = 240 minus 74 = 166 miles
7) NB and SB routes and detours are virtually the same, so do not need to document twice.



UNDER ROUTE H04 = Reichart Road, a frontage road, running North-South

1) The functional class map shows the route is yellow = 6 Minor Collector.
2) Staying on similar class routes, the yellow+ detour would be from Farmerville to Girard to Virden to Divernon Street.
   a) BUT Google Maps won't route on Diverton Road between Kennedy Road (bridge 084-3188 is closed).
   b) Any detour off of Diverton Road would be a lower class route.
   c) Since a lower class route is unavoidable, no need to go all the way to Diverton Road – detour on the nearest local route.
3) Original route = 1.1 miles: https://maps.app.goo.gl/WCkFTAZqRBurjqSQ8
4) Detour route = 3.0 miles: https://maps.app.goo.gl/qk2qVNenutNp8FoR7
5) Detour length = 3.0 minus 1.1 equals 1.9 which rounds to 2 miles.





APPENDIX C – E/E' FATIGUE DETAIL CATEGORIES for B.IR.02

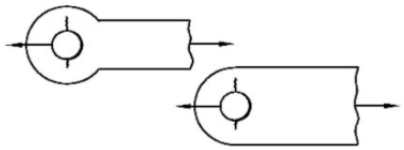
Sources:

- Bridge Inspector's Reference Manual (BIRM)
  - 2022 NBIS Revised March 2023
  - Chapter 7: Materials, Material Deficiencies, and Inspection Methods
  - Table 7.3.4, pages 7-107 thru 7-114 (this is a BIRM table that replicates an LRFD table)
- AASHTO LRFD Bridge Design Specifications
  - 9th Edition, 2020
  - Table 6.6.1.2.3-1 Detail Categories for Load-Induced Fatigue

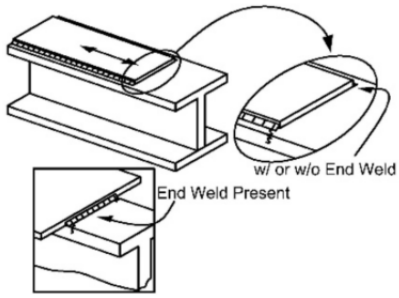
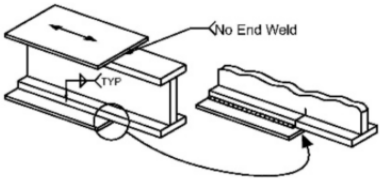
Note: only the sections with E or E' details are extracted here. The full table is 8 pages and offers some perspective on what is NOT an E/E' detail.

Section 1—Plain Material away from Any Welding – no E/E' details

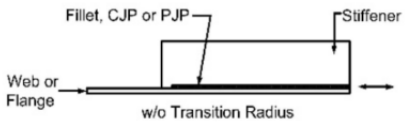
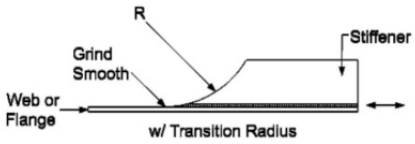
Section 2—Connected Material in Mechanically Fastened Joints

Description	Category	Constant A $(ksi)^3$	Threshold $(\Delta F)_{TH}$ ksi	Potential Crack Initiation Point	Illustrative Examples
2.4 Base metal at the net section of eyebar heads or pin plates (Note: for base metal in the shank of eyebars or through the gross section of pin plates, see Condition 1.1 or 1.2, as applicable.)	E	11×10^8	4.5	In the net section originating at the side of the hole	

Section 3—Welded Joints Joining Components of Built-up Members

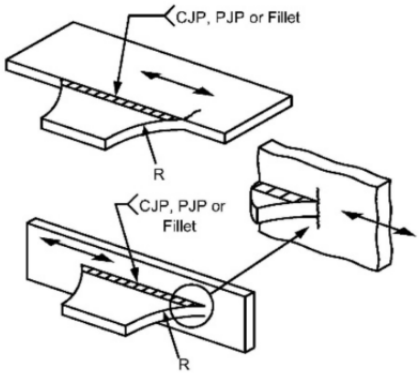
3.5 Base metal at the termination of partial length welded cover plates having square or tapered ends that are narrower than the flange, with or without welds across the ends, or cover plates that are wider than the flange with welds across the ends:				In the flange at the toe of the end weld or in the flange at the termination of the longitudinal weld or in the edge of the flange with wide cover plates	
Flange thickness ≤ 0.8 in.	E	11×10^8	4.5		
Flange thickness > 0.8 in.	E′	3.9×10^8	2.6		*continued on next page*
3.7 Base metal at the termination of partial length welded cover plates that are wider than the flange and without welds across the ends.	E′	3.9×10^8	2.6	In the edge of the flange at the end of the cover plate weld	

Section 4—Welded Stiffener

4.3 Base metal at the termination of longitudinal stiffener-to-web or longitudinal stiffener-to-box flange welds:					
With the stiffener attached by welds and with no transition radius provided at the termination:				In the primary member at the end of the weld at the weld toe	
Stiffener thickness < 1.0 in.	E	11×10^8	4.5		
Stiffener thickness ≥ 1.0 in.	E′	3.9×10^8	2.6		
With the stiffener attached by welds and with a transition radius R provided at the termination with the weld termination ground smooth:					
$R \geq 24$ in.	B	120×10^8	16		
24 in. $> R \geq 6$ in.	C	44×10^8	10	In the primary member near the point of tangency of the radius	
6 in. $> R \geq 2$ in.	D	22×10^8	7		
2 in. $> R$	E	11×10^8	4.5		

Section 5—Welded Joints Transverse to the Direction of Primary Stress – no E/E' details

Section 6—Transversely Loaded Welded Attachments

6.1 Base metal in a longitudinally loaded component at a transversely loaded detail (e.g., a lateral connection plate) attached by a weld parallel to the direction of primary stress and incorporating a transition radius R:				Near point of tangency of the radius at the edge of the longitudinally loaded component or at the toe of the weld at the weld termination if not ground smooth	
With the weld termination ground smooth:					
$R \geq 24$ in.	B	120×10^8	16		
24 in. $> R \geq 6$ in.	C	44×10^8	10		
6 in. $> R \geq 2$ in.	D	22×10^8	7		
2 in. $> R$	E	11×10^8	4.5		
For any transition radius with the weld termination not ground smooth.	E	11×10^8	4.5		
(Note: Condition 6.2, 6.3 or 6.4, as applicable, shall also be checked.)					