

**National Bridge Inspection Standards &
Bridge Maintenance Program Review
Perry County
June 18, 2021**

(November 2021 update)

By: Mark Sherman, PE

CEAO Federal Bridge QA/QC Engineer

IN ATTENDANCE:

Kent Cannon, Perry County Engineer

Tim Frash, Deputy County Engineer

Mark Sherman, CEAO Federal Bridge QA/QC Engineer

SCOPE OF REVIEW:

The review consisted of interviews with Perry County personnel, reviews of inspection and inventory data, and reviews of Perry County bridge records. The office evaluation assessed Perry County's organization, procedures, resources, and documentation regarding the inspection, inventory, and maintenance operations for bridges. In addition, field reviews of 6 bridges were conducted to determine if ratings were consistent with the ODOT Coding Manual and FHWA Recording and Coding Guide and to determine if inventory items were coded correctly. The bridges were selected by Perry County to represent a variety of structure types and conditions. The bridges checked during the field review were:

<u>Asset Name</u>	<u>Bridge Type</u>	<u>County Rating</u>	<u>NBIS Rating</u>
PER-T0181-0060_(6434177)	Steel Beams	5	Agreed
PER-T0181-0040_(6434169)	Steel Beams	4	Agreed
PER-C0113-0025_(6432603)	Steel Beams	5	Closer to a 3 or 4
PER-C0098-0250_(6432468)	Concrete slab Simple	5	Agreed
PER-C0097-0010_(6432425)	Continuous slab	4	Agreed
PER-T0057-0010_(6433294)	Prestressed Box beams	6	Agreed

FINDINGS AND COMMENTS:

General:

Ohio State statutes establish requirements governing the safety inspection of all bridges within the State borders. ODOT with participation of FHWA has developed the ODOT publication Bridge Inspection Manual, hereafter referred to as the Manual, which establishes guidance and requirements regarding bridge inspections within the State. FHWA has determined that ODOT guidance meets or exceeds the FHWA NBIS requirements.

The federal regulations for administering the NBIS are located in the Code of Federal Regulations 23 Highways – Part 650 Subpart C - National Bridge Inspection Standards. The regulations can be found at the following web site:

<http://wwwcf.fhwa.dot.gov/legsregs/directives/fapg/cfr0650c.htm>

Ohio currently rates bridge element conditions with a 1-4 scale. Summary items conform to the definitions and rating scales established by the NBIS. The NBIS do not require element level condition rating for County bridges unless they are on the expanded National Highway System (NHS) beginning October 1, 2014.

Perry County has inspection responsibilities for **162** bridges, **117** of which are longer than 20 feet in length and **45** which are 10 feet to 20 feet long. The NBIS inspection and load rating requirements only pertain to highway bridges in excess of 20' long on public roads. Review of the inventory span lengths showed that all bridges had the NBIS designation Y/N coded correctly.

The office review and the field review demonstrated that County personnel were inspecting and coding bridges in accordance with ODOT's Bridge Inspection Manual ("Manual").

Inspection Procedures:

Perry County utilizes their own staff to do the inspections and supplements their inspection with outside consultants such as B&N. Previous inspection reports are available at site for review. The previous year's inspection reports are on paper and transferred to AssetWise in the office. Bridge comments are recorded in the inspection form.

Bridge plans are available in the office. Photos are available for every bridge, and photos are taken (if needed) of defects during inspection and posted in Assetwise.

The County has **0** bridges that require a snooper.

A Team Leader is present at routine inspections.

Frequency of Inspections (metric 6 & 7)

Ohio State Transportation Laws require all State and local bridges to be inspected annually.

Perry County had **162** bridges inspected in 2020. The NBIS maximum inspection frequency of two years is met. All Bridges over 10 feet in length are inspected annually. The Engineer determines the need for a routine inspection frequency greater than once a year, based on inspections and history.

There are no bridges that require inspection more frequently than one year.

Perry County had 0 bridges overdue for Fracture Critical inspection at the time of this field review.

Qualification and Duties of Personnel (metric 1 & 2)

Program Manager:

Kent Cannon, Perry County Engineer

List qualifications/yrs. Experience.

Engineer for county for 28 years. 6 years with ODOT

List courses attended (& approx. dates). **Approved by ODOT on Legacy list.**

Team Leader and Team Reviewer and Load Rating Engineer:

Tim Frash

List qualifications/yrs. experience (bridge inspection experience)

22 yrs. Experience

List courses attended (& approx. dates).

Level 1 Bridge Inspection 6/22/2015; 2/28/2012; 12/12/2000; 11/4-6/2009

Level 2 Bridge Inspection 3/20/2001

Refresher training 12/12/2000; 3/15/2011; 8/9/2017

Underwater Bridge inspector: NA

Inspection Reports (metric 12)

As part of this review, eight bridges were field reviewed to compare conditions with the most recent inspection report. The individual condition ratings for all of the field sampled bridges properly reflected the field conditions within the tolerance of 1 rating value when compared to the Manual. Summary ratings correspond with the NBIS inspection items.

Field Review:

[PER-T0181-0060_\(6434177\)](#) Steel beam bridge

- Item 58 Deck..... 8 Agreed
 - Item 59 Superstructure.....5 Agreed
 - Item 60 Substructure.....7 Agreed
 - Item 61 Channel.....8 Agreed
 - Item 61.01 Scour.....7 *undermining at rear abutment sheet piling would put this much lower.*
 - Item 62 Culvert.....N
 - Item 36 Railing..... 0 0 0 0 Agreed
 - Item 72 Approach Alignment 5 Agreed
- Comments: *No Comments in Assetwise but are extensive in bridge files.*
 Defect Photos: *Photos not in Assetwise, but office files contain good photos.*
 Channel Photos: *None is Assetwise, but photos in office file are good.*

[PER-T0181-0040_\(6434169\)](#) Steel Beam

- Item 58 Deck..... 6 Agreed
- Item 59 Superstructure.....4 Agreed
- Item 60 Substructure.....6 Agreed
- Item 61 Channel.....7 Agreed
 - Item 61.01 Scour.....7 Agreed
- Item 62 Culvert.....N
- Item 36 Railing..... 0 0 0 0 Agreed
- Item 72 Approach Alignment 8 Agreed

Comments: *Comments on file in office.*
Defect Photos: *Office file photos are extensive.*
Channel Photos: *Office file has similar photo the one below.*

PER-C0113-0025_(6432603) Steel Beams

Item 58 Deck..... 8 Agreed

Item 59 Superstructure.....5 Retrofit may not be adequate I put this at a 4.

Item 60 Substructure.....8 Agreed

Item 61 Channel.....8 Agreed

Item 61.01 Scour.....7 Agreed

Item 62 Culvert.....N

Item 36 Railing..... 0 0 0 0

Item 72 Approach Alignment 8

Item 734 Percent %..... 150% Given the beam conditions and retrofit, a recalculated load capacity is in order.

Comments: Comments on file in office.

Defect Photos: Office file photos are extensive.

Channel Photos: Office file has complete photo bank.

PER-C0098-0250_(6432468) Concrete slab

Item 58 Deck..... 5 Agreed

Item 59 Superstructure.....6 super and Deck are the same for slab bridges. Tables yield a 5 for this super.

Item 60 Substructure.....5 Agreed

Item 61 Channel.....5 Agreed

Item 61.01 Scour.....7 Agreed

Item 62 Culvert.....N

Item 36 Railing 0 0 0 0

Item 72 Approach Alignment 6 Agreed

Comments: Comments on file in office.

Defect Photos: Office file photos are extensive.

Channel Photos: Office file has similar photo the one below.

PER-C0097-0010_(6432425) Concrete Continuous Slab

Item 58 Deck.....4

Item 59 Superstructure.....4

Item 60 Substructure.....5

Item 61 Channel.....7 Agreed

Item 61.01 Scour.....7 Agreed

Item 62 Culvert.....N Agreed

Item 36 Railing..... 0 0 0 0 Agreed

Item 72 Approach Alignment 5 Agreed

Comments: Comments on file in office.

Defect Photos: Office file photos are extensive.

Channel Photos: Office file has similar photo the one below

PER-T0057-0010_(6433294) Prestressed Box Beams

Item 58 Deck..... 6 Agreed

Item 59 Superstructure.....6 Agreed
Item 60 Substructure.....8 Agreed
Item 61 Channel.....9 Agreed
Item 61.01 Scour.....7 Agreed
Item 62 Culvert.....N
Item 36 Railing..... 0 0 0 0 Agreed
Item 72 Approach Alignment 6 Agreed

Comments: [Comments on file in office.](#)

Defect Photos: [Office file photos are extensive.](#)

Channel Photos: [Office file has similar photo the one below](#)

Inventory Items

Review of the bridge data showed **13** out of **117** bridges were missing comments when the rating was ≤ 5 . This requirement became effective Nov of 2020. **0** bridges have Scour governing the substructure rating. SFNs: . And **0** of those bridges have a disparity of 2 or more change in points for scour.

Bridge Files: (metric 15)

Perry County keeps files listed below as follows:

All of the following are kept in Office Files and paper format unless noted.

- Inspection reports, including old inspections **Physical bridge files and computer files.**
- Design Calculations **Physical bridge files and computer files.**
- Plans **Physical bridge files.**
- Load analysis calculations **Physical bridge files and computer files.**
- Inventory forms **AssetWise.**
- Photos and sketches **Physical bridge files and computer files.**
- Repairs and maintenance history **Physical bridge files.**
- Scour evaluation **NA**
- Scour POA **NA**
- Fracture Critical File **Physical bridge files.**
- Load Posting/Closing **Physical bridge files.**
- Underwater inspections **NA**
- Special inspection eqpt. or procedures
- Flood data, waterway adequacy, channel cross sections **Physical bridge files and computer files.**

Note the NBIS Retention period: BR-86 report 10 years, All records 3 years after bridge removed, Load rating calculations 3 years after a new rating is done.

Load Rating (metric 13)

The inventory shows **117 (100.00%)** of the County NBIS bridges have been Load Rated or Load Rating was not applicable. There are **8** NBIS bridges evaluated by documented engineering judgement using the BR100 form. Load Ratings were checked for **SFNs. 6430376; 6431798; 6434312.**

The load posting at the bridge matched the load rating on all bridges. P.E. name and stamp were on all of the bridges. Documentation was on all of the bridges. BR100 form is available for all engineering judgment bridges.

Zero NBIS bridges have not load rated.

Three bridges had NBI 070 rating that did not match the % legal. Column AV in the Load Rating Tab of Snapshot file.

[PER-T0391-0088_\(6436072\)](#); [PER-C0033-0100_\(6431224\)](#); [PER-C0026-0420_\(6430929\)](#)

Load Posting (metric 14)

Perry County has **14** NBIS bridges that are load posted. There is **0** bridge closed for condition ratings. Posting is based on Operating Rating. **R12-H5** signs are the type of sign used for load posting.

While the County has **14** bridge that are posted, only **one** posting date entered in Assetwise for sign installation. See Load rating TAB in Snapshot file.

There are **1** bridge where the % legal (Item 41) does not match the Posting code A or P (Item 734 See Column S & T in the Load Rating TAB

[PER-C0057-0110_\(6431798\)](#)

There are no bridges rated 3 or less that are not closed.

Special Features: There are 0 bridges with unique or special features.

Fracture Critical Bridges (metric 16)

The FC bridge inspection frequency is 12 months, done with routine annual inspections.

FC Bridges: [SFNs 4230876, 4231449, 4232399, 4232933, 4234561, 4235967, 4236262, 4236394, 4236785](#)

FC Plan and plans for: [Sample provided in Office files review. 6432255 PER-C086-0160 truss and 6430244 PER-C008-0142 truss](#) were satisfactory.

Gusset Plate Calcs. [The two trusses above were provided in Office files review were satisfactory!](#)

Underwater Inspections and Scour: **NA**

QA/QC

The QA/QC section of the 2014 Bridge Inspection Manual meets the FHWA requirement. The Inventory items are checked and updated during annual inspections.

Critical Findings (metric 21)

The county currently does not have any critical findings, but does have a Critical Findings Procedure in place (using the ODOT inspection manual). The county engineer is the bridge inspector and develops the plans for emergency work.

Bridge Maintenance (From Questionnaire)

The County does contract bridge work. The typical work is for large bridges, replacements and

repairs. Fed Funds are sometimes used for bridge deck replacement and Credit Bridge Funds are used for bridge replacements. The annual budget varies from year to year but averages **\$400,000.00** for Contract work.

The county does force account bridge work and uses highway maintenance crews as needed. Typical work items include all repairs and medium replacements. The annual budget for force account work is approximately **\$150,000.00**.

The chart below is a review of the 23 Metrics used to measure NBIS compliance and the chart represent a preliminary, tentative assessment of the county's level of compliance. Action steps for compliance are listed at the bottom. The actual assessments of NBIS compliance are made by FHWA, based on documentation, and any final determinations of compliance may differ from this preliminary assessment. The Metric 12 & 22 result on the following page is based on the field review of the six bridges visited during the QAR using the NBIP Field Review Checklist - PY 2013, Minimum Level Review Items.

PRELIMINARY FHWA 23 Metric Matrix

23 metrics used by FHWA to measure NBIS compliance. Actual "score" by FHWA may differ.

Compliance Codes for the following Metrics:

- (C) Compliant
- (SC) Substantially Compliant
- (CC) Conditionally Compliant
- (NC) Not Compliant

Metric	Description	(C)	(SC)	(CC)	(NC)
1	State Bridge Inspection Organization				
2	Program Manager Qualification				
3	Team Leader Qualification				
4	Load Rating Engineer Qualification				
5	UW Bridge Inspection Diver Qualification				
6	Routine Inspection Frequency - Low Risk				
7	Routine Inspection Frequency - High Risk				
8	UW Inspection Frequency - Low Risk				
9	UW Inspection Frequency - High Risk				
10	FC Inspection Frequency				
11	Frequency Criteria				
12	Inspection Quality				
13	Load Rating				
14	Posted or Restricted Bridges				
15	Bridge Files				
16	FC Bridges				
17	UW inspection procedures				
18	Scour Critical Bridges				
19	Complex Bridges				
20	QC/QA				

21	Critical Findings			
22	Inventory **			
23	Updating of Data			

** based on results of Field Review

Action Items for Perry County:

Metric 6 Catch up on inspection due dates

Metric 12 Routine inspections get data and comments information into ASSETWISE

Metric 14 Fix the Posting fields in Assetwise