Quality Assurance Review

National Bridge Inspection Standards &
Bridge Maintenance Program

Mahoning County

April 25, 2022

By: Mark Sherman, PE
CEAO Federal Bridge QA/QC Engineer

The scope of this review is to evaluate the agency's bridge inspection program based upon The Ohio Revised Code, the ODOT Manual of Bridge Inspection (MBI), and the National Bridge Inspection Standards (NBIS). This includes the following checklist, interviews with staff members responsible for the inspection program, review of files and documentation, and field inspection of bridges. Note: the inspection program includes inventory, maintenance and load rating in addition to the field inspections.

Agency Reviewed: **Mahoning County**

Checklist completed by: **Bob Durbin & Jason Popa** Date: **March 16, 2022**

I. MAINTENANCE, REHABILITATION AND REPLACEMENT PROGRAM

A. NUMBER OF BRIDGES WITH MAINTENANCE RESPONSIBILITY

1. Greater than 20' long (NBIS length 23CFR 650c) (Metric 22) 99

2. Bridges >= 10' and <= 20' long (Metric 22) 187

B. PROCEDURES AND BUDGET

1. Contract repairs and replacement per year
- List typical work items

Replacements: Number: Culverts: **1-2** Bridges: **3-4**
Rehabilitations: Number :
Maint.Contracts Number: Culverts: **0** Bridges: 1 - 2
Culverts: **0** Bridges: 0

-List approximate annual budget: **$500,000**

-Are Fed Funds used? Yes_ No
-Are Credit Bridge funds used? Yes_ No

2. In-house repairs and replacements

Replacements: Number: Culverts:

Rehabilitations: Number: Culverts: **15-20** Bridges:_1_-2_ _

Maint.Contracts Number: Culverts: Bridges:_1-'-·=2__ _

1-2

Bridges:_0____

0

- List approximate annual budget $100,000

3. How are projects identified and selected? Check all that apply.

X Inspection reports.

X Sufficiency rating.

_ Growth/development.

_ Other... explain_____

4. How are plans developed for emergency repairs? Check all that apply.

X In-house **X**

Consultant

X Contractor

_ Other explain_____

5. Who does the work of emergency repairs? Check all that apply.

X In house

X Contractor

_ Other explain __

_____

6. How is repair work documented? (i.e. work record, time card, plans?)

X Work orders
Time Cards

X Plans

7. Who is empowered to order emergency road closures and how is it done?

X	Engineer	Notifies Commissioners & Sherriff
X	Sherriff	Notifies Commissioners & Engineer
X	Commissioners?	Notifies Engineer & Sherriff

II. INSPECTION PROGRAM

A. NUMBER OF BRIDGES WITH INSPECTION RESPONSIBILITY

1. Greater than 20' long (NBIS length, ORC 5501.47, 5543.20) (Metric 22) **99** __

2. Between 1O' and 20' long (ORC 5501.47, 5543.20) (Metric 22) **187**

8. STAFFING

1. Name of individual who is the **Program Manager** (makes FINAL DECISION). List qualifications/yrs. experience (bridge inspection experience)
(Metric 1&2)

- Name: **Patrick Ginnetti, Mahoning County Engineer**
- Yrs. Inspection related experience: **0** _

- List courses attended (&approx.dates) **none**

2. Name of individual in charge of bridge inspection unit **(Reviewer).** List qualifications/yrs. experience (bridge inspection experience) (Metric 1)

- Name: **Consultant Charles Jason Popa PE**

- Yrs. Inspection related experience: **30 years**

-List courses attended (& approx. dates) **See attached resume**

3. Team Leader - individual in charge of bridge inspection team (INSPECTED BY). List qualifications/yrs. experience (bridge inspection experience)
(Metric 1&3)

- Name: **Consultant Charles Jason Popa PE**

- Yrs. Inspection related experience: **30 years**

-List courses attended (& approx. dates) **See attached resume**

Indicate the percentage of time spent on the listed duties in the previous year

%TIME on inspections:

100	Bridge/Culvert inspection	___	Surveying
___	Bridge Design/Plan prep	--	Other -
___	Bridge Construction		
___	Bridge Maintenance	--	100%
___	Overload/Superload		

4. Load Rating Engineer - Name of individual responsible for load ratings (must be **PE)** **(Metric 4)**

a. List Ohio PE # **60606** b. Name **Charles Jason Popa**

5. Underwater Bridge Inspection Diver - Name person doing dive inspections (Metrics)

- Name: **David Cornish, Greenman-Pedersen. (will complete the underwater inspections in May 2022)**
- Yrs. Inspection related experience: **ll.,years**

C. List courses attended (& approx. dates) **See attached resume**

D. INSPECTION EQUIPMENT

1. Type of vehicle used for inspections

_X_ Pickup truck
Van
SUV
Custom vehicle

2. What typical inspection equipment does the inspection team normally carry with them to the inspection site? Check all that apply.

Ext. Ladder length	24 ft.	First Aid Kit	yes
6' Folding Rule	yes	Wire Brush	yes
100' Fiberglass Tape	yes	Calipers	yes
Geologist Hammer	yes	Shovel	yes
Inspection Mirror	yes	Screw Driver	yes
Flashlight	yes	Pliers	yes
Thermometer	yes	Wrenches	yes
Plumb Bob	yes	Sounding Chains	yes
Camera	yes	Hip Boots and Waders	yes
2'-0" Level	yes	Paint Stick/Crayon	yes
Brush Hook/Axe	yes	Scraper	yes
Boat	**no**	Probing Rod	yes
		Vertical Clearance Rod	no

Other equipment not listed above**:** **I use a canoe when high water dictates the use.**

1. List types of NOT methods used? Circle all that apply.

Dye penetrant; Magnetic particle; Ultrasound; Other_____

What equipment does your team have available for "hands on" access to FCM bridge members? (Metric 16)

A complete set of single rope climbing gear and an offset bracket.

5. Use of equipment (Metric 16)
   a. How many bridges need a snooper? 1
   b. How many bridges is it used on? _..;..1
   c. How often? **2 years**

E. INSPECTION PROCEDURES

1. Approximately how many inspections were made during last calendar year? (Metric 6) **286**

2. Approximately how many inspections are scheduled for the current calendar year? (Metric 6) **286**

3. Average number of inspections per day **17** (Metric 6)

4. Approximately how long (hours) does it take to inspect average sized structures

   a. Beam/Girder: Simple Span: **0.50** hrs. Multi-span: **1.0** hrs.

   b. Slab bridge: Simple Span: **0.50** hrs. Multi-span: **0.50** hrs.

   c. Truss (pony): Simple Span: **1.0** hrs. Multi-span: **2.0** hrs.

   d. Through/deck): Simple Span: **1.0** hrs. Multi-span: **2.0** hrs.

   e. Culvert: Single cell **0.25** hrs. Multiple Cells: **0.25** hrs.

5.) Are previous inspection reports available at site for review? (Yes X No_)**(Metric 15)**

Are bridge inspections recorded in field on Paper, or **Electronically,** or Both?

Are photos available for every bridge? (YesX No_) (Ifno,youneed to start.)

Are photos posted in Assetwise? (YesX No_) (If no, you need to start, and be selective.)

Are defects photos taken during inspection? (Yes No_) (If no, you need to start.) Are Bridge comments recorded in Assetwise? (Yes XN0 _) (If no, you need to start.) Are previous bridge comments brought to the bridge? (Yes XN0 _) (If no, why not)

6a. Are the bridge plans carried to the bridge site for review? (Metric 15). (Yes_ NoX)

6b. Are bridge records available for review in the bridge office? (Metric 15). (Yes X No_)

7. Who determines the need for a routine inspection frequency greater than once Annually, and what criteria is used? (Metric 6)

Explain: **County Engineer per bridge inspector's recommendation. Criteria based on deterioration of load carrying members.**

8. Do you have bridges requiring inspection more frequently than 12 Months? (Yes_ No X)

_0_Number due to **Damage** _____List frequency Of inspection. (Metric 11)_

_0__Number needing **In-depth** _____List frequency Of inspection. (Metric 11) __

_0__Number of **Special insp.** _____List frequency Of inspection. (Metric 11)

9. Does your inspection team believe it has enough time to do the job? (Yes X No_)

10. List your quality assurance checks made during the inspection process? (Metric2oi

Each inspection is gone over 3 separate times, once in the field, once when the data is entered into Assetwise and once when the inspection is reviewed.

11a. Do you have any bridges that need underwater inspections in less than 60-month intervals? **(Metric 8)**

Yes__ No_X_ (Assetwise check)

12a. Do any bridges have fracture critical inspections performed more frequently than 24-month **intervals? (Metric 10)** Yes__ No_X_ (Assetwise check)

13. Is a Team Leader at the bridge at all times during the following inspections? (Metric 12)

Initial Inspection? Yes X No_)

Routine Annual Inspections? Yes X No_)

Special Inspections? Yes X No_)

Underwater Inspections? Yes X No_)

F. SCOUR CRITICAL BRIDGES (Guidance in ODOT Manual of Bridge Inspection)

1. No. of bridges considered scour susceptible? (Service over Water) Number **100%**
2. Number of bridges inspected by probing? Number **30%**
3. Number of Scour Critical bridges (item 113 - 3, 2, 1 or 0)? (Metric 18) Number **_0 _**
4. Are Plans of Action (POA) complete and implemented for all bridges coded "Scour Critical"**?** (Metric18) **Yes X_ No_____** If no, Why? _____

5. How many structures are coded 6 on item 113 Scour Critical? (Metric 18) Number -0--_
6. How are scour evaluations performed? (Metric 18) **Engineering Judgement**
7. Who determines the need for diving inspections and by what criteria?
   County Engineer based on past history.

G. INVENTORY

1. What kinds of inventory quality assurance checks are performed? (Metric 22)

   Who checks? **Bridge Inspector**

   How Often?...With every inspection_X Less often than once per year_

2. How often is the inventory checked for needed updates? (Metric 22)

   How Often?...With every inspection_X Less often than once per year_

3. How is the inventory data input into Assetwise?

   _X_ Electronically, Direct into Assetwise from collector App. as bridge is inspected All at once at the end of the year from a paper copy into Assetwise

   As each inspection is complete from paper to computer to Assetwise.

4. When is the updated/new inventory data forwarded to ODOT? (Metric 23)

   Changes discovered during inspection? **YES_X __** NO

   Changes from new construction or rehab? **YES_X_____** NO

5. NBIS requires that the inspecting organization maintain master lists of the following:(Me1r1c 1s,11,11)

a. Bridges that contain fracture critical members, including the location and description of such members on the bridge and the inspection procedures of such members (Each individual FCM member on each FCM bridge must be clearly identified in the bridge file) (Where a FCM Identification Plan exists then look for remaining fatigue life). Master List?
Yes Number **100%** : If, No, Why not? _____

b. Bridges requiring underwater inspections. Number **4**

c. Bridges with unique or special features (i.e., pin & hanger, draw, suspension)
Number__ NA.

Note: An examination of the files will be performed during the review.

- **Bridge Files .....email a copy of a typical file or have them on hand for inspection.**
- **Scour Critical POA.. email a copy of a typical file or have them on hand for inspection.**
- **Fracture Critical Plan.. email a copy of a typical file or have them on hand for inspection.**
- **UW inspection Procedure.. email a copy of a typical file or have them on hand for inspection.**

H. PROCEDURES

1. Are new maintenance problems identified during bridge inspection?
(**Y_X N_**) **(Metric** 15)

2. How do the inspectors inform maintenance personnel of routine bridge maintenance problems (written, oral, other)? (Metric 15)

X Written work order.

__ Electronic Communication.

__ Oral direction.

___ Other. Explain._____

3. Who do the inspectors notify when emergency repairs, or critical findings are necessary (action required within 1 week)? (Metric 21) Check all that apply.

_X_ County Engineer

_X_ County Bridge Engineer

___ Bridge Superintendent

___ Sherriff

How is this emergency action documented? (Must be entered and tracked in Assetwise)

Explain if different than procedure in **Assetwise** _____

4. If a bridge requires emergency repairs, is this noted as part of the inspection report or as a separate document? (Metric 21) Separate document, End of inspection cycle maintenance report.

5. Who checks proper placement of signs (load posting, clearance, speed restriction, narrow bridge etc.)? (Metric 1s **Bridge Inspector** _____ __

I. LOAD ANALYSIS AND POSTING

1. Number of plans for existing bridges available for NBIS length bridges. _75%_

2. Number of plans for non-NBIS bridges (>= 10' and <= 20' long) _50%_

3. Number of bridges analyzed using the *AASHTO Manual for Bridge Evaluation* (Metric 13J

By Whom (Metric 13)

_X _Load Rating Engineer
___ County Engineer
___ Bridge Engineer
X Consultant

5. When are bridges load rated, after initial rating. Check all that apply

___ Every 5 years regardless.

_X_When there is a significant change in condition rating.

X When wearing surface thickness increases more than 1-1/2 inches

_X_ When permit load is requested

other

6. Methods used (Metric 13)

_X _ AASHTO BrR

___ Hand Calculated

_X_ Engineering Judgement (BR100)

___ BARS or other proprietary software program

Other Explain_____

7. Number of NBIS length bridges not load rated (Metric 13) Number _0___

Why? _____

8. List the NBIS length bridges considered "not ratable" including reason for being considered **"not ratable" (Metric13)** **_N_/A**_____ __

9. Number of NBIS length bridges load posted (Metric 14) (Assetwise Check)

Number of bridges posted _8_. Number of bridges with posted Signs in the field_8_.

10. List bridges closed due to condition rating (rough check) _____ 0_____

11. List bridges rated less than 100% Ohio legal load and not physically load posted, and resolution. (Assetwise Check) _____0_

12. Number of NBIS bridges with Gusset Plates (Metric 13)_____3_____

13. Number of NBIS bridges with Gusset Plates analyzed. (Metric 13) _____3_____

14. Describe filing system (where files are kept): (Metric 1si

- Inspection reports, including old inspections:

_X_ On paper file in Office

_X_ Electronically

_X_ In Assetwise

_X_ All three

Other

- Design Calculations:
  _X On paper file in Office
  _X Electronically

  In Assetwise
  All three
  Other

- **Plans:**
  _X_ On paper file in Office
  _X_ Electronically

  In Assetwise
  All three
  Other

- Load analysis calculations:
  _X_ On paper file in Office
  _X_ Electronically

  In Assetwise
  All three
  Other
  __
- Inventory forms:
  On paper file in Office
  _X_ Electronically
  _X_ In Assetwise
  All three
  Other

- Photos and sketches:
  __ On paper file in Office
  _X_ Electronically

  _X_ In Assetwise

  All three
  Other

- Repairs and maintenance history
  _X_ On paper file in Office
  _X_ Electronically

  In Assetwise

All three
Other

- Scour evaluation:
  _XX On paper file in Office
  Electronically
  In Assetwise
  All three
  Other

- Scour POA:
  On paper file in Office
  Electronically
  In Assetwise
  All three
  Other

- Fracture Critical File:
  _X On paper file in Office
  _X Electronically

  In Assetwise
  All three
  Other

- Load Posting/Closing:
  On paper file in Office
  Electronically
  _ In Assetwise
  X All three

  Other

- Underwater inspections:
  On paper file in Office
  Electronically
  _ In Assetwise
  .X _ All three

  Other

- Special inspection eqpt. or procedures:
  X _ On paper file in Office

  X Electronically
  In Assetwise
  All three
  Other

- Flood data, waterway adequacy, channel cross sections:
  X_ On paper file in Office
  Electronically
  In Assetwise

All three
Other

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.

15. What is the FC bridge inspection frequency? (Metric 16) Every **24** Months
16. Is the FC Plan completed for all FC bridges? (Metric 16) (Yes .X No _)
17. Are the FCM Identified in the FC Plan? (Metric 16) (Yes ..X No _)
18. What is the underwater inspection frequency? (Metric 11) Every **60** Months
19. Are the underwater elements identified and located? (Metric 11) (Yes X No_)
20. List any complex bridges: (Metric 19) N/A

21. Do the complex bridges require specialized inspection procedures and additional inspector training? (Metric 19) (Yes_ No_) Describe:

Part II: Field Review

Inspection Reports (metric 12)

As part of this review, seven 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:

MAH-00318-0019 _(5058406) Cont. Steel beams

Item 58 Deck……..4 Agreed
Item 59 Superstructure……5 Agreed
Item 60 Substructure…….4 Agreed
Item 61 Channel……..6 Agreed
Item 61.01 Scour……..7 Agreed
Item 62 Culvert……N
Item 36 Railing…….. 0 N N N Agreed
Item 72 Approach Alignment ……..6 Agreed
Comments: Good Comments in Assetwise
Defect Photos: I would have liked to have seen a defect photo of the hammerhead pier cap since it is significant.

Channel Photos: Channel photos are the best one can achieve given the location and terrain.

MAH-00136-0198 _(5042224) twin Corrugated steel culvert pipes

Item 58 Deck…….. **N**
Item 59 Superstructure……**N**
Item 60 Substructure…….**N**
Item 61 Channel……..**5** Agreed
Item 61.01 Scour……..**6** Agreed
Item 62 Culvert……..**4** Agreed The 4 rating may be a little harsh due to the location of the deterioration being far away from the load path. However, because there is water flowing under the structure tells me there may be voids under the pipes, potentially compromising the overall integrity of the system. The 4 is agreeable.
Item 36 Railing……..1 N 1 0 Agreed
Item 72 Approach Alignment ……..7 Agreed
Comments: Good Comments.
Defect Photos: Good defect photos
Channel Photos Good channel Photos

MAH-00073-00007 _(5042062) Concrete Arch

Item 58 Deck…….. N Agreed
Item 59 Superstructure……4 Agreed
Item 60 Substructure…….5 Agreed
Item 61 Channel…….. 4 Agreed
Item 61.01 Scour…….. 6 Agreed
Item 62 Culvert…….. **N**
Item 36 Railing …….. 1 1 1 1 Agreed
Item 72 Approach Alignment ……..7 Agreed
Comments: Great comments in Assetwise
Defect Photos: Great defect photos in Assetwise
Channel Photos: Great Channel photos in Assetwise

MAH-00074-00170 _(5034116) Conc Tee beams

Item 58 Deck…….. 5 Agreed
Item 59 Superstructure…… 5 Agreed
Item 60 Substructure……. 5 Agreed
Item 61 Channel……..7 Agreed
Item 61.01 Scour……..7 Agreed
Item 62 Culvert……..N Agreed
Item 36 Railing…… 1 0 0 0 Agreed
Item 72 Approach Alignment ……..8 Agreed
Comments: Great comments in Assetwise
Defect Photos: Great defect photos in Assetwise
Channel Photos: Great Channel photos in Assetwise

MAH-00028-00579 _(5044251) Concrete Box beams (105) Should be 505 Prestressed Box beams

Item 58 Deck…….. 4 Agreed
Item 59 Superstructure……4 Agreed
Item 60 Substructure……7 Agreed
Item 61 Channel…….. 6 Agreed
Item 61.01 Scour…….. 7 Agreed
Item 62 Culvert…….. N Agreed
Item 36 Railing…….. 1 1 1 1 Agreed
Item 72 Approach Alignment ……..8 Agreed
Comments: Great comments in Assetwise
Defect Photos: Great defect photos in Assetwise
Channel Photos: Great Channel photos in Assetwise

MAH-00061-0093 _(5044235) Conc. Cont. Slab

Item 58 Deck……..6 Agreed
Item 59 Superstructure……6 Agreed
Item 60 Substructure……..4 Agreed
Item 61 Channel……..4 Agreed
Item 61.01 Scour…….. 4 Agreed
Item 62 Culvert……..N Agreed
Item 36 Railing…… 1 0 0 0 Agreed
Item 72 Approach Alignment ……..8 Agreed
Comments: Very Good Comments
Defect Photos: Very Good Photos in Assetwise
Channel Photos: Very Good Channel Photos

MAH-00045-00166 _(5044219) Steel Girder

Item 58 Deck……..7 Agreed
Item 59 Superstructure……5 Agreed
Item 60 Substructure……6 Agreed
Item 61 Channel……..N Agreed
Item 61.01 Scour……..N
Item 62 Culvert……..N
Item 36 Railing…….. 1 1 1 1 Agreed
Item 72 Approach Alignment …. 8 Vertical curve at bridge makes it impossible to see. This is a 5 at best.

Comments: Very Good Comments
Defect Photos: Great defect Photos
Channel Photos: NA over RR

MAH-00503-0081 _(5058457) K-frame A588 steel frame bridge.

While this bridge was not part of my QAR review, I was present during the Snooper inspection. ODOT and the consultant did a thorough inspection, which found no problems with the superstructure. While the point of the inspection was the integrity of the superstructure, other observations were also made that need some attention. Particularly the bearing areas of the pier/K legs. There are dense vines propagating from the foundation up the frame leg that make it nearly impossible to inspect this area.

Field Review Summary:

Overall, the county is doing a great job with their bridge inspection program. Their records are complete and organized. I found their ratings to be well within the parameters set by the manual. The comments are very good as well as corresponding photos. The channel section photos are compliant as physically possible.

PART III Office file Review

Fracture critical bridges
MAH-00045-00.166 (5044219)

Fracture Critical Member and Fatigue Prone Connection ID Plan.
MAH-00045-00.166 (5044219)

Bridge Load Rating Report, including Gusset plate analysis.
NA

Underwater inspections
- SFN 5030307 on Mahoning Avenue west bound over the Meander Reservoir
- SFN 5030277 on Mahoning Avenue east bound over the Meander Reservoir
- SFN 5050103 on Mahoning Avenue over Lake Milton
- SFN 5058554 on Jacobs Road over McKelvey Lake

POA for Scour Standard Action Plan for all bridges. Those that do not have UW inspection are probed when scour is initiated.

Scour susceptible bridges. All bridges over streams

Critical findings NA

All files are complete with all documentation concerning load rating, channel photos and defect photos, along with previous inspection reports. Their files are complete and comprehensive, documenting the history of every bridge through reports, plans and photographs.

PART IV Snapshot DATA Summary of Program

MAHONING County 2022

INVENTORY, APPRAISAL & INSPECTION SNAPSHOT

12/20/2022

Inventory Data - NBIS Bridges Only

	NBIS COUNT
NBIS Bridges > 20'	101
Bridges 10'-20'	185
All Bridges	286

Item 221 Inspection Responsibility		CODE	#NBIS	#ALL
Data Tab Col BV,BW	County	2	101	286

Item 21 Maintenance responsibility		CODE	#NBIS	#ALL
Data Tab	County	2	101	286
Col D	City or other local	4	0	0
	Railroad	27	0	0
	Private (tohter than RR)	26	0	0
	State Park	11	0	0
	Local Park	23	0	0
	State Agency	1	0	0
	Township	3	0	0
			101	286

Item 42A Type service on bridge		CODE	#NBIS	#ALL
Data Tab	Other	0	0	0
Col Q	Highway	1	76	240
	Railroad	2	0	0
	Ped/Bikeway	3	0	0
	Hwy/RR	4	0	0
	Hwy/Ped	5	25	46
			101	286

Item 42B Type service under bridge		CODE	#NBIS	#ALL
Data Tab	Other	0	0	0
Col R	Hwy w/ or w/o Ped	1	1	1
	Railroad	2	1	1
	Ped/Bkwy	3	0	0
	Hwy w/ RR	4	0	0
	Waterway	5	94	279
	Hwy/Waterway	6	0	0
	RR/Waterway	7	2	2
	Hwy/Waterway/RR	8	3	3
	Relief (for waterways)	9	0	0
			101	286

All data is complete and correct in this section.

ITEMS 43A,B,C Structure Type	Data (Col M.N,O)	CODE	# NBIS	# ALL
Concrete Slab		101	16	123
Concrete Tee Beam		104	11	12
Concrete Box Beam/Girder Multiple		105	2	2
Concrete Frame		107	1	13
Concrete Deck Arch		111	1	1
Concrete Culvert (incl frame culverts)		119	5	38
Concrete Continuous Slab		201	11	11
Concrete Continuous Tee Beam		204	1	1
Concrete Continuous Frame		207	0	1
Steel Beam or Girder		302	7	8
Steel Girder w/ Floor System		303	1	1
Steel Thru Arch		312	2	2
Steel Culvert (incl frame culverts)		319	7	32
Steel Continuous Beam or Girder		402	20	20
Steel Frame (exc. Culverts)		407	1	1
Prestressed Concrete Other		500	0	1
Prestressed Concrete Slab		501	0	1
Prestressed Concrete Thru Arch		502	2	2
Prestr. Conc. Cont. Box Beam/Girder Multiple		505	11	14
Timber Deck Arch		811	2	2
			101	286

Item 92A Fracture Critical		CODE	# NBIS	# ALL
Data Tab	Requires FC Inspection	Y	**3**	n/a
Col U,V,Y	Requires FC Inspection	N	**98**	n/a
			101	n/a
	FC Switch Y/N is Blank		0	n/a

All data is complete and correct in this section.

Item 113 Scour			# NBIS	# ALL
Data Tab	Bridge not over waterway	N	2	2
Col AA	unknown foundation	U	0	0
	over tidal waters	T	0	0
	foundations on dry land	9	1	1
	stable above footing	8	81	229
	countermeasures installed	7	0	0
	no scour evaluation made	6	0	0
	stable within footer limits	5	16	51
	stable action needed	4	1	3
	scour critical - unstable	3	0	0
	scour critical - scour present	2	0	0
	scour critical - failure imminent	1	0	0
	scour critical - bridge failed	0	0	0
			101	286

Item 92B Underwater		CODE	# NBIS	# ALL
Data Tab	requires dive inspection	N	97	n/a
Col W,X,Z	requires dive inspection	Y	4	n/a
			101	

The bridges above have a non-critical finding scour rating of 4, that requires corrective measures. Once the measures are implemented the scour rating should move to a 7. See Column AA in Data TAB of the Snapshot for Light Blue highlights.
Note: (If these measures were taken, then the rating needs changed. If not, then you need a plan for corrective measures. A code of 4 or less should not be in the system for more than a year.)

All data is complete and correct in this section.

Item 709	Plan Information	CODE	# NBIS	# ALL
Data Tab	plans not avail	0	**7**	8
Col. AW	plan avail	1	**87**	270
	field measured	2	**7**	7
	Field Testing	3	**0**	0
	not applicable	N	**0**	1
			101	286

Item 63	Method of Analysis	CODE	# NBIS	# ALL
Data Tab	Field Eval & Doc. Engr Judgment	0	**4**	5
Col. AV	Work Stress	1	**0**	0
	LFR	2	**0**	0
	LRFR	3	**0**	0
	load test	4	**0**	0
	No rating done	5	**0**	158
	LFR	6	**88**	102
	AS	7	**3**	10
	LRFR	8	**6**	11
	Assigned LFR HS20	D	**0**	0
	Assigned LRFR HL93	F	**0**	0
	not appl (RR, etc)	X	**0**	0
			101	286

REMINDER:

Load Factor required for bridges built after 1993 **(exceptions: timber, etc,)**

LRFR required for bridges built after 2010

Note: Given the changes coming in 2023 and the now required shear analysis, please make sure your load rating documentations are complete and include a BR100 with complete statements of assumptions, measurements and methodologies for anything using engineering judgement.

All data is complete and correct in this section.

Inspection Condition Data - NBIS Bridges Only

Item 41	Operating Status	CODE	# NBIS	# ALL
Data Tab	Open, No restriction	A	**93**	278
Col AM	Open, posting recommended	B	**0**	0
	Open, Half width constr.	C	**0**	0
	Open because of temp. fix	D	**0**	0
	Open using temp. structure	E	**0**	0
	New struture not yet open	G	**0**	0
	closed for load cap. reason	K	**0**	0
	Posted for load capacity	P	**8**	8
	Posted for other than load	R	**0**	0
	Closed for other than load	X	**0**	0
			101	286

Metric 13	Load Rating Data	
Load Rating Tab		# OF ERRORS
Col. AN	Op RF greater than Inv RF?	0
Col. AO	Posting and % Legal OK?	0
Col. AP	"0" used instead of blank	0
Col. AT	% legal <> lowest RF	0
Col.A V	Item 70 correct?	0
Col. AW	Method of Rating Alike?	0
Col. AX	Op & Inv RF in Tons as req'd?	0
Col. AY	Item 575 correct?	0
Col. AZ	Depth of fill completed?	0

All data is complete and correct in this section.

KEY METRICS

(C)	Compliant	(CC)	Conditionally Compliant
(SC)	Substantially Compliant	(NC)	Non- Compliant
		(NC)	(SC) If corrected within 6/12 months
			Refresher=6 mo, Comprehensive=12 mo

METRIC 2 - Program Manager Qualificatio (from files examination)

From Files review	Missing	#sampled	% PASS	COMPLIANCE
PE /Experience	0	1	100.0%	(C)
Comprehensive	0	1	100.0%	(C)
Refresher	0	1	100.0%	(C)

METRIC 3 - Team Leader Qualification (from files examination)

From Files review	Missing	#sampled	% PASS	COMPLIANCE
Degree /Experience	0	1	100.0%	(C)
Comprehensive	0	1	100.0%	(C)
Refresher	0	1	100.0%	(C)

METRIC 6 Insp. Frequency Routine

Bridge Inspections Overdue			# OVERDUE	% PASS	COMPLIANCE
Data Tab	NBIS -	24 months	0	100.0%	(C)
Col. AB	ORC -	Calendar Year	0	100.0%	(C)
Col. AB	All	Routine insp.	0		
	BIM -	18 months	0	100.0%	(C)

All data is complete and correct in this section.

METRIC 6 Insp. Frequency Routine							
Bridge Inspections Overdue			**# OVERDUE**			**% PASS**	**COMPLIANCE**
Data Tab	NBIS -	24 months	0			100.0%	(C)
Col. AB	ORC -	Calendar Year	0			100.0%	(C)
Col. AB	All	Routine insp.	0				
	BIM -	18 months	0			100.0%	(C)
METRIC 8 - Insp. Frequency Underwater							
Dive Inspections Overdue			**# OVERDUE**	**# UW**		**% PASS**	**COMPLIANCE**
Data Tab Col. Z		60 months	0	4		100.0%	(C)
METRIC 10 - Insp. Frequency FC Member							
FC Inspections Overdue			**# OVERDUE**	**# FC**		**% PASS**	**COMPLIANCE**
Data Tab Col. Y		24 months	0	3		100.0%	(C)
METRIC 12 - Routine Inspection			(** from field review)				
Field Ratings			**# > +/-1**	**# Ratings**		**% PASS**	**COMPLIANCE**
	field ratings**		0	24		100.0%	(C)
Comments			**Missing**	**# < 6**		**% PASS**	
Tab	Comments when Rating < 6		1	99		99.0%	(C)
	Adequacy comments **		0	30		100.0%	(C)
			Error	**Total Scour**		**% PASS**	
Comments	Rating should be = Scour		0	96		100.0%	within tolerance +/- 1
Tab	Noncompliant Scour Rating Err		0	96		100.0%	(C)

MAH-00171-0050 (5058201) Missing Channel Comments

All data is complete and correct in this section.

METRIC 14 - Posting	Load rating data tab			
From Files review	**# errors**	**#sampled**	**% PASS**	**COMPLIANCE**
Op RF < 3 tons but not closed	0	99	100.0%	(C)
Op RF = 0 but not closed	0	99	100.0%	(C)
% Legal < 100 but not posted	0	99	100.0%	(C)
Item 41 = B	0	99	100.0%	(C)

METRIC 16 - Fracture Critical Inspection	(from files examination)			
From Files review	**Missing**	**# FC**	**% PASS**	**COMPLIANCE**
Fract Critical Member ID	0	2	100.0%	(C)
Fatigue Prone Detail	0	2	100.0%	(C)
Gusset Plate Calculations	0	2	100.0%	(C)
FC Inspection Procedure	0	2	100.0%	(C)

METRIC 17 - Underwater Inspection	(from files examination)			
From Files review	**Missing**	**# UW**	**% PASS**	**COMPLIANCE**
UW Inspection Procedure	0	1	100.0%	(C)
Location of UW elements	0	1	100.0%	(C)
UW frequency identified	0	**1**	100.0%	(C)

All data is complete and correct in this section.

PRELIMINARY FHWA 23 Metric Matrix

23 metrics used by FHWA to measure NBIS compliance

Compliance Codes for the following Metrics:

(C)	Compliant
(SC)	Substantially Compliant
(CC)	Conditionally Compliant (Adhering to approved PCA)
(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

Metric	Action Needed

Mahoning County is compliant in every metric. Overall, they are performing very well with their bridge program.