Quality Assurance Review

National Bridge Inspection Standards &
Bridge Maintenance Program

Columbiana County

April 26, 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:_ Columbiana County Engineers Office

Checklist completed by: Tom Hutson, Troy Graft Date: 4/2022

I. MAINTENANCE, REHABILITATION AND REPLACEMENT PROGRAM

A. NUMBER OF BRIDGES WITH MAINTENANCE RESPONSIBILITY

1. Greater than 20' long (NBIS length 23CFR 650c) **(Metric 22)** **167**

2. Bridges >= 10' and <= 20' long **(Metric 22)** **124**

B. PROCEDURES AND BUDGET

1. Contract repairs and replacement per year

- List typical work items

Replacements: Number: Culverts:____ Bridges:___2__
Rehabilitations: Number : Culverts:____ Bridges:_____
Maint.Contracts Number : Culverts:____ Bridges:_____

-List approximate annual budget: ___$1,000,000_____

- Are Fed Funds used? Yes _X_ No ___
- Are Credit Bridge funds used? Yes _X_ No ___

2. In-house repairs and replacements

Replacements: Number: Culverts:__6__ Bridges:_____
Rehabilitations: Number: Culverts:__2__ Bridges:___3____
Maint.Contracts Number: Culverts:____ Bridges:_____

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

_____ Inspection reports.
_____ Sufficiency rating.
_____ Growth/development.
__X__ Other…explain _____Condition, traffic counts and funding.____

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

__X__ In-house
_____ Consultant
_____ Contractor
__X__ Other explain ___Repairs made immediately If necessary, _____
closed until repairs are made.

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

__X__ In house
_____ Contractor
_____ Other explain _____

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

_____ Work orders
_____ Time Cards
_____ Plans _____Noted in bridge files_____

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

__X__ Engineer?
_____ Sherriff?
_____ Commissioners? Bert Dawson, County Engineer, Bill Helscel, Chief Deputy Engineer, Troy Graft, Chief Bridge Engineer by site visit.

II. INSPECTION PROGRAM

A. NUMBER OF BRIDGES WITH INSPECTION RESPONSIBILITY

1. Greater than 20' long (NBIS length, ORC 5501.47, 5543.20) **(Metric 22)** **167**_____

2. Between 10' and 20' long (ORC 5501.47, 5543.20) **(Metric 22)** ___**124**___

B. STAFFING

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

- Name: _ Troy Graft, PE_____

- Yrs. Inspection related experience: __26____

- List courses attended (& approx. dates) _Element Level Insp.(2016), Structure Management (2013), Manual of Bridge Insp.(2011), Bridge Insp. Level 1 & 2 (2010) Load Rating Hand Calculation 2009

_____

_____

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

- Name: __Troy Graft, PE_____

- Yrs. Inspection related experience: ____26_____

- List courses attended (& approx. dates) _LTAP Bridge Inspection Updates 2021 Element Level Insp.(2016), Structure Management (2013), Manual of Bridge Insp.(2011), Bridge Insp. Level 1 & 2 (2010)
Load Rating Hand Calculation 2009

_____

_____

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

- Name: _____Tom Hutson_____

- Yrs. Inspection related experience: ____44_____

- List courses attended (& approx. dates) LTAP Bridge Inspection Updates 2021)_ LTAP 5 year Refresher (2020)__Element Level Insp.(2016), Structure Management (2013), Manual of Bridge Insp.(2011), Bridge Insp. Level 1 & 2 (2010)Load Rating Hand

Calculation(2009)

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

%TIME on inspections:

__60_ Bridge/Culvert inspection
__20_ Bridge Design/Plan prep
_____ Bridge Construction
_____ Bridge Maintenance
___2_ Overload/Superload
_____ Surveying
__18_ Other -
_____100%

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

a. List Ohio PE # ___65578_____ b. Name ___Troy Graft_____

5. **Underwater Bridge Inspection Diver** – Name person doing dive inspections **(Metric 5)**

- Name:
_____N/A_____

- Yrs. Inspection related experience: _____

- List courses attended (& approx dates) _____

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.

Extension Ladder	_X_	Length _14’		Geologist Hammer	_X_
6’ Folding Rule		_X_		Inspection Mirror	_X_
100' Fiberglass Tape		_X_		Flashlight	_X_

Thermometer	___	Screw Driver	_X_
Plumb Bob	_X_	Pliers	_X_
Camera	_X_	Wrenches	_X_
2'-0" Level	_X_	Sounding Chains	_X_
Brush Hook/Axe	_X_	Hip Boots and Waders	_X_
Boat	_X__	Paint Stick/Crayon	_X_
First Aid Kit	_X_	Scraper	_X_
Wire Brush	_X_	Probing Rod	_X_
Calipers	_X_	Vertical Clearance Rod	_X_
Shovel	_X_		

Other equipment not listed above ____Distal Laser _____

3. List types of NDT methods used? Circle all that apply.

Dye penetrant; Magnetic particle; Ultrasound; Other ___N/A_____

5. What equipment does your team have available for "hands on" access to FCM bridge members? **(Metric 16)** Climbing gear, ladders, scissor lift, boom truck rental

6. Use of equipment **(Metric 16)**

a. How many bridges need a snooper? ___4___

b. How many bridges is it used on? ____4_____

c. How often? ___24 mths _____

E. INSPECTION PROCEDURES

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

307 (includes 16 R-R overheads)

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

307 (includes 16 R-R overheads)

3. Average number of inspections per day **(Metric 6)** **8-12**

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

a. Beam/Girder: Simple Span: _.5-.75__hrs. Multi-span: __.75-1__hrs.

b. Slab bridge: Simple Span: __.5-.75___hrs. Multi-span: _.75-1__hrs.

c. Truss (pony): Simple Span: __1-2___hrs. Multi-span: __N/A___hrs.

d. Through/deck): Simple Span: _1-3___hrs. Multi-span: _N/A___hrs.
e. Culvert: Single cell __.5 -.75__ _hrs. Multiple Cells: _.5 -.75_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? (Yes _X_ No __) **(If no, you need to start.)**

Are photos posted in Assetwise? (Yes _X_ No ___) **(If no, you need to start, and be selective.)**

Are defects photos taken during inspection? (Yes _X_ No __) **(If no, you need to start.)**

Are Bridge comments recorded in Assetwise? (Yes _X_No __) **(If no, you need to start.)**

Are previous bridge comments brought to the bridge? (Yes _X__No ___) **(If no, why not)**

6a. Are the bridge plans carried to the bridge site for review? **(Metric 15).** (Yes __ No _X_)

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, Chief Bridge Engineer, Team Leader, condition

_____

8. Do you have bridges requiring inspection more frequently than 12 Months? (Yes __ No _X_)

_N/A___Number due to **Damage** _____List frequency of inspection. **(Metric 11)**___

_N/A___ Number needing **In-depth** _____List frequency of inspection. **(Metric 11)**____
_N/A___ 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? **(Metric 20)**

_____
_ Program Manager and Team Leader, yearly inspection discussions and reviews
_____
_____

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 ___ No ___)

Fracture Critical 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 __278___.

2. Number of bridges inspected by probing? Number ___5___.

3. Number of Scour Critical bridges (item 113 - 3, 2, 1 or 0)? **(Metric 18)** Number __N/A____.

4. Are Plans of Action (POA) complete and implemented for all bridges coded "Scour Critical"? **(Metric 18)** Yes____ No_____ If no, Why? _____N/A_____

5. How many structures are coded 6 on item 113 Scour Critical? **(Metric 18)** Number _N/A__.

6. How are scour evaluations performed? **(Metric 18)**
_____Visual, probing_____

7. Who determines the need for diving inspections and by what criteria?

_____N/A_____

_____

G. INVENTORY

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

   Who checks? _____Updates as they arise, ODOT error checks_____

   How Often?. ODOT discovery, major bridge changes. With every inspection___ 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:**(Metric 16,17,11)**

   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_X_ Number__15___: If, No, Why not? _____ NA___
   b. Bridges requiring underwater inspections.
   Number_____N/A____

   c. Bridges with unique or special features (i.e., pin & hanger, draw, suspension)
   Number_____ N/A___

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

X- **Bridge Files……email a copy of a typical file or have them on hand for inspection.**
X- **Scour Critical POA.. email a copy of a typical file or have them on hand for inspection.**
X- **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)**

_____ Written work order.

__X___ Electronic Communication.

__X___ Oral direction.

__X___ Other. Explain - Phone call, email, pictures, person to person, _____

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

__X__ Bridge Superintendent

____Sherriff

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

Explain if different than procedure in Assetwise - Inspection report if discovered during regular inspection, Photographs. Notification to Chief Deputy Engineer, or Chief Bridge Engineer, (site visit if necessary), Crews dispatched day of discovery. After repairs made. Noted in bridge file.

_____

4. If a bridge requires emergency repairs, is this noted as part of the inspection report or as a separate document? **(Metric 21)**
_____Inspection Report_____

5. Who checks proper placement of signs (load posting, clearance, speed restriction, narrow bridge etc.)? **(Metric 15)**

_____ Sign Manager_____

I. LOAD ANALYSIS AND POSTING

1. Number of plans for existing bridges available for NBIS length bridges. __140_____

2. Number of plans for non-NBIS bridges (>= 10' and <= 20' long) ___112_____

3. Number of bridges analyzed using the *AASHTO Manual for Bridge Evaluation* **(Metric 13)** 140

By Whom **(Metric 13)**
____Load Rating Engineer
____County Engineer
_X _ 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.
____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
_X__ Hand Calculated
_X__ Engineering Judgement (BR100)
_X__ BARS or other proprietary software program
_X__ Other Explain -Brass, ,in house and or ODOT spreadsheets_____

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" **(Metric 13)**
N/A

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

Number of bridges posted __22___. Number of bridges with posted Signs in the field__22___.

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)** _____9_____

13. Number of NBIS bridges with Gusset Plates analyzed. **(Metric 13)** _____9_____

14. Describe filing system (where files are kept): **(Metric 15)**

- Inspection reports, including old inspections:
  __ __ On paper file in Office
  __ __ Electronically
  __ __ 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
  __ __ Electronically
  __ __ In Assetwise
  __X__ All three
  _____ Other

- Photos and sketches:
  __ __ On paper file in Office
  __ __ Electronically
  __ __ In Assetwise
  __X__ All three
  _____ Other
- Repairs and maintenance history

__ __ On paper file in Office
__ __ Electronically
__ __ In Assetwise
__X__ All three
_____ Other

- Scour evaluation:
  _____ On paper file in Office
  _____ Electronically
  __ _ In Assetwise
  __X_ All three
  _____ Other

- Scour POA:
  __X_ 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: N/A
  _____ On paper file in Office
  _____ Electronically
  _____ In Assetwise
  _____ All three
  _____ Other
- Special inspection eqpt. or procedures: N/A
  _____ On paper file in Office
  _____ Electronically
  _____ In Assetwise
  _____ All three
  _____ Other

- Flood data, waterway adequacy, channel cross sections: N/A
  __X__ On paper file in Office

__X__ 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 17)** ___Every _N/A___ Months_____

19. Are the underwater elements identified and located? **(Metric 17)** (Yes _N/A__ 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 _N/A__ No ___)

Describe:

Part II: Field Review

Inspection Reports (metric 12)

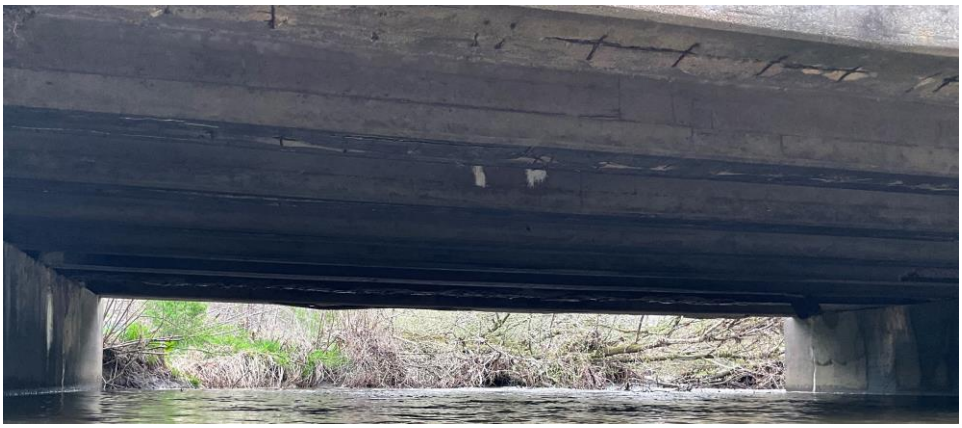
As part of this review, six bridges were field reviewed to compare conditions with the most recent inspection report. The individual condition ratings for all of the field sampled bridges properly reflected the field conditions within the tolerance of 1 rating value when compared to the Manual.
Summary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

Field Review:

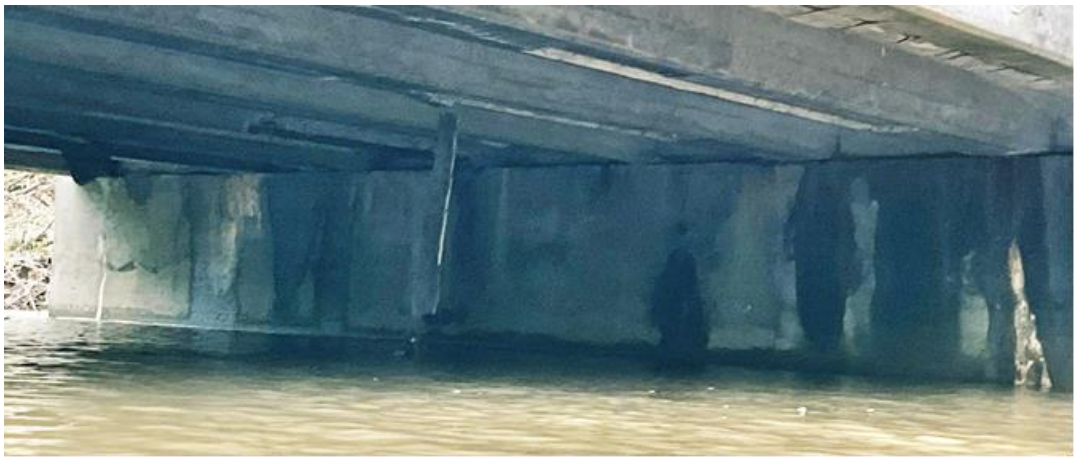
COL-C0416-023712_(1532170) Concrete Tee Beam (Concrete encased steel beams)

Item 58 Deck…….. 6 Agreed Water was too high for me to get under and sound. I could see some cracking from a distance.

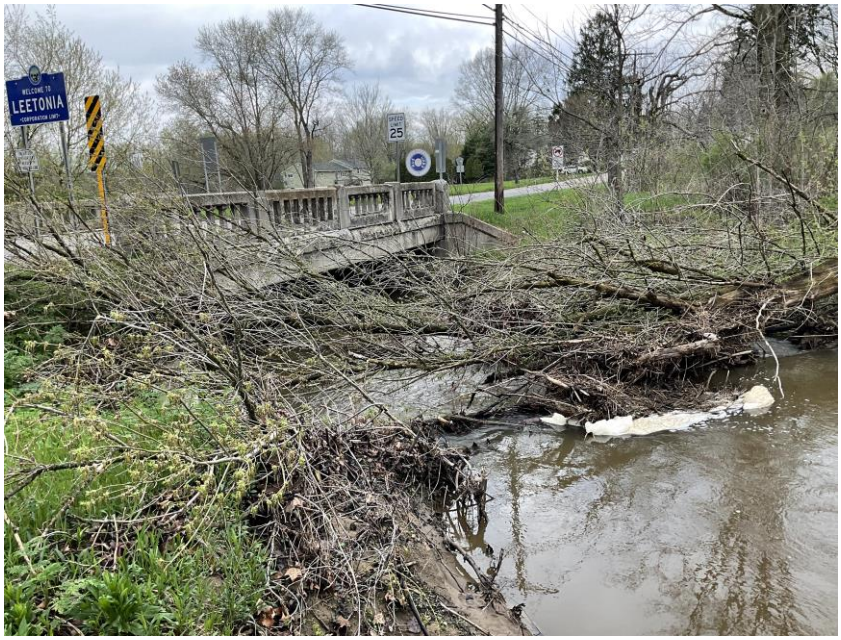
Item 59 Superstructure…..6 While I agree with this rating. My only concern is with the amount of material hanging down and the degree of spalling which appears to be greater than what was recorded last July during the routine inspection. This bridge is due for inspection this summer and should be re-evaluated in comparison to last year's report. If there is no section loss on the steel beams, then I am good with the 6 rating.



Item 60 Substructure……..8 Agreed Again, without having to access the abutments physically, I could not sound the abutment faces. There is a fair amount of staining and water leakage, but no spalling. Given the age a visual appearance, age and efflorescence where the curb line falls, I would rate this abutment a 7.



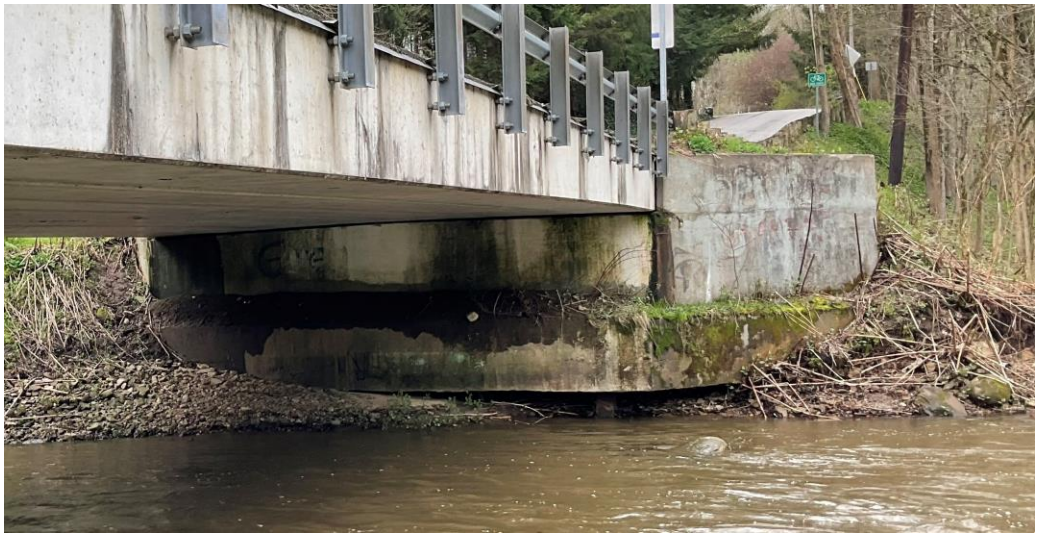
Item 61 Channel……..8 Agreed While the channel looks to have a good alignment, a tree has recently fallen across the channel upstream of the bridge and has the potential to cause scour to develop.

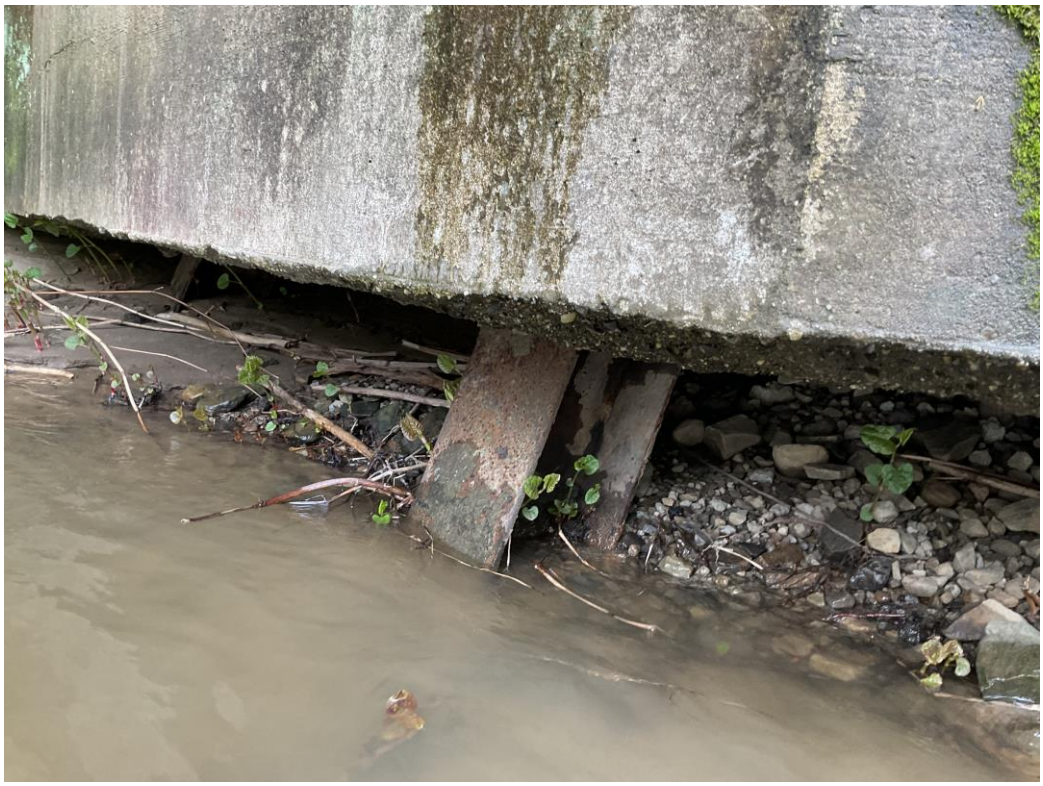


Item 61.01 Scour……7 Agreed
Item 62 Culvert…… N
Item 36 Railing…….. 0 N N N Agreed
Item 72 Approach Alignment ……7 Agreed
Comments: Good comments in Assetwise.
Defect Photos: Photos in Assetwise indicate a lesser amount of deterioration than now appears to be. It is certainly possible that deterioration has occurred in the last 12 months.
Channel Photos: Great Channel Photos in Assetwise

COL-T0761-121A32_(1535528) Prestressed Box Beams

Item 58 Deck……..8 Agreed
Item 59 Superstructure……7 Agreed
Item 60 Substructure…….6 Agreed The abutments are in very good shape, however, see scour comment below.
Item 61 Channel……..6 Agreed
Item 61.01 Scour…….. 6 Agreed There is scour present, although it appears to be stable. The manual calls for this to be a 5 because there are 3 piling exposed for about a foot. It needs to be a 5. Even though the situation is stable at the moment, I recommend further stabilization with concrete and/or rock in order to reduce the potential for further scour activity. This could end up a 4 if subjected to a heavy storm event. (Since scour controls the substructure, then Item 60 must also be a 5.)





Substructure Scour, deep foundations – "ded" CONDITION RATING

Item - **42. Scour**

Type – **Deep Foundations: Piles, Drilled Shafts, including Spread Footing on Rock**

1-4	9-0 Total Bridge	Description*	Exposed Deep Foundation*
1-Good	9-Excellent	No Problems noted.	
	8-Very Good	Minor scour holes developing, scour protection placed.	
	7-Good	Some minor problems. Minor scour holes exist; probing indicated soft material in scour hole.	top of footing and first 6-inches exposed
2-Fair	6-Satisfactory	Damage to scour countermeasures, probing indicates soft material in scour hole.	Full height side of footing exposed
	5-Fair	Minor scour, damage to scour countermeasures, probing indicates soft material in scour hole.	One or two pilings are visible less than 10% of piling height**
3-Poor	4-Poor	Advanced scour.	1/3 of the front row of piling exposed less 10% of piling height**
	3-Serious	Scour has seriously affected the primary structural components Local failures are possible.	Any one piling exposed above or below water more than 3-feet high, more than 1/3 of the front row of piling exposed less than 10% of piling height**
4-Critical	2-Critical	Scour may have removed substructure support. Local failures are possible	Any substructure unit with more than 20% of bearing capacity removed.
	1-Imminent Failure	Obvious vertical or horizontal movement due to scour that is affecting the structure stability. Bridge is closed to traffic but corrective action may put bridge back in to light service.	
	0-Failed	Out of service - beyond corrective action.	

Table 52 - Condition Rating: Substructure Deep Foundations Scour

Item 62 Culvert…… **N**

Item 36 Railing …….. 1 1 1 1

Item 72 Approach Alignment ……..8 Agreed

Comments: Very good comments in Assetwise that reinforce the lower rating for scour and Substructure.

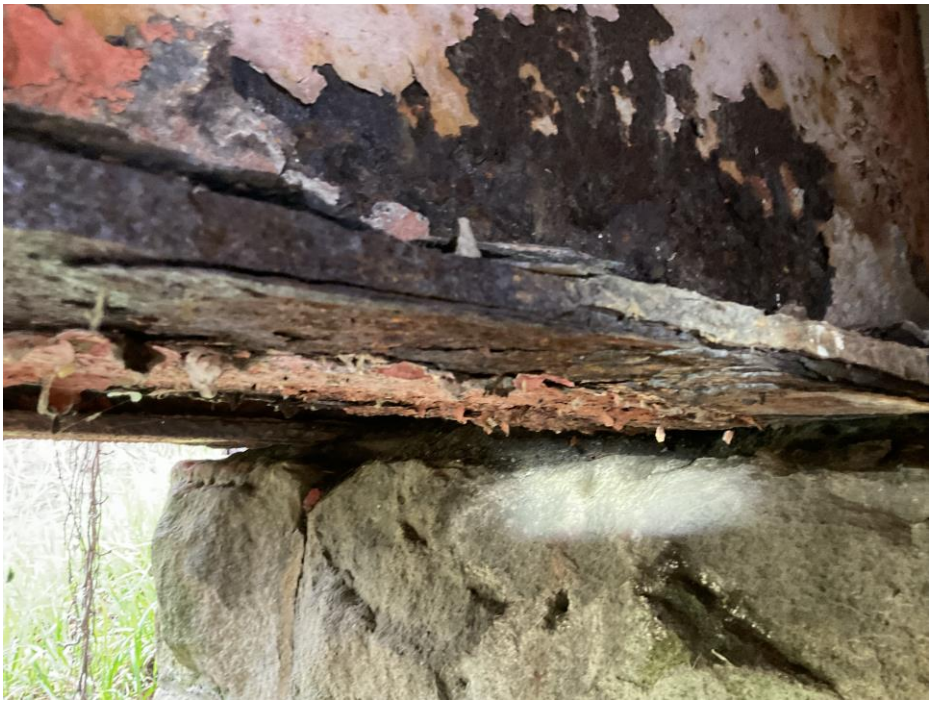
Defect Photos: Could use close-up of the scour at the foundation line.

Channel Photos: Great channel Photos in Assetwise

COL-T0742-014425_(1535978) Steel beams

Item 58 Deck……..7 Agreed

Item 59 Superstructure…… 6 Agreed Some beams are rusting and beginning to lose section near, or at the bearing area, like the one below.



Item 60 Substructure……..8 Agreed

Item 61 Channel…….. 8 Agreed

Item 61.01 Scour……..7 Agreed

Item 62 Culvert……..N Agreed

Item 36 Railing…… 1 N N 1 Agreed

Item 72 Approach Alignment ……..8 Agreed

Comments: Comments don't reflect photos in Assetwise. While the comments are generally good in identifying the defects, they could be more specific with more location, severity and extent. The information given is a little too general.

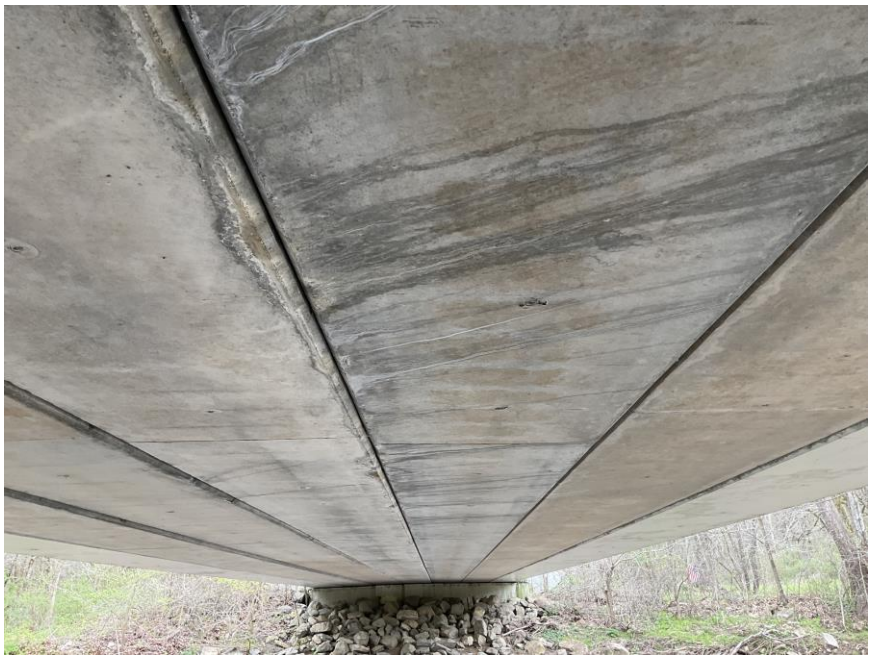
Defect Photos: 2018 Photos of channel in Assetwise show almost no beam rust or deterioration, unlike what we saw this year during this QAR visit. Need updated photos like the one above.

Channel Photos: Again, great Channel Photos

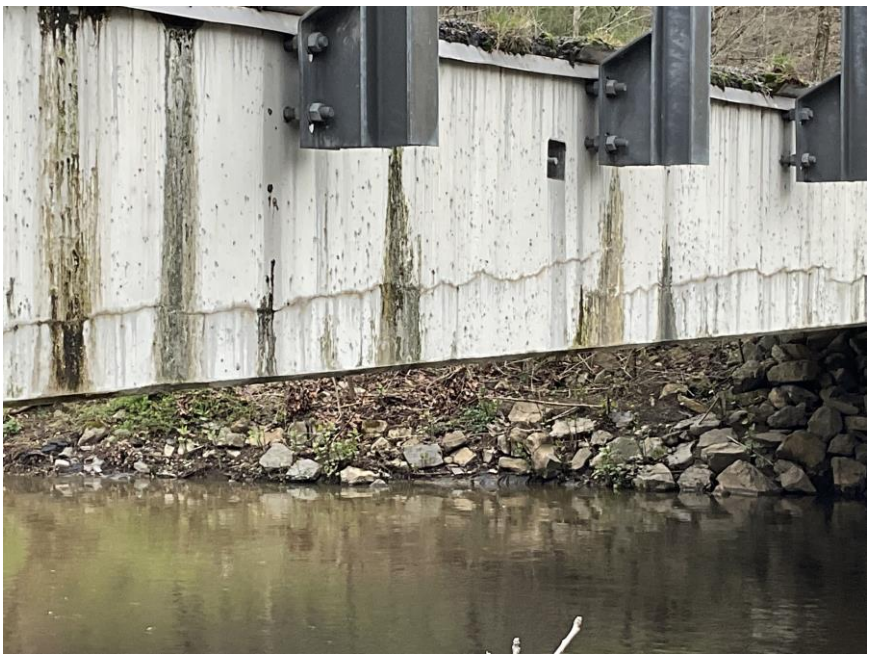
COL-T0896-010236_(1537601) Prestressed Boxes

Item 58 Deck……7 Agreed The deck rating has to be the same as the Superstructure, if there is no separately poured deck.

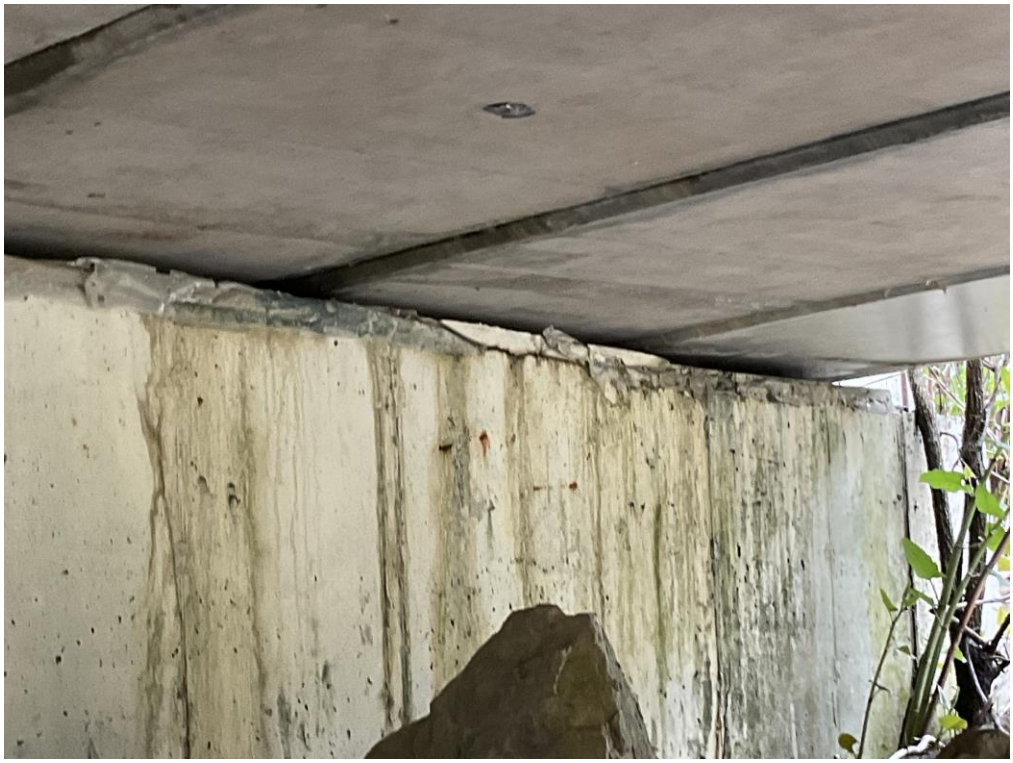
Item 59 Superstructure……6 Agreed There is minimal to no leakage though the beam joints. I am pretty sure the beams were waterproofed and paved. There does not appear to be any true deck.



The beams have unusual horizontal shear cracking that appears to have initiated during, or shortly after construction. It appears to be stable and not a structural issue, having been there for the best part of 20 years. It is unknown if the interior beams have this condition. The manual does not address this type of cracking. I could go with a 6 or 7 on the superstructure. I lean toward a 7 due to the condition of the beam bottoms, including the fascia beams.



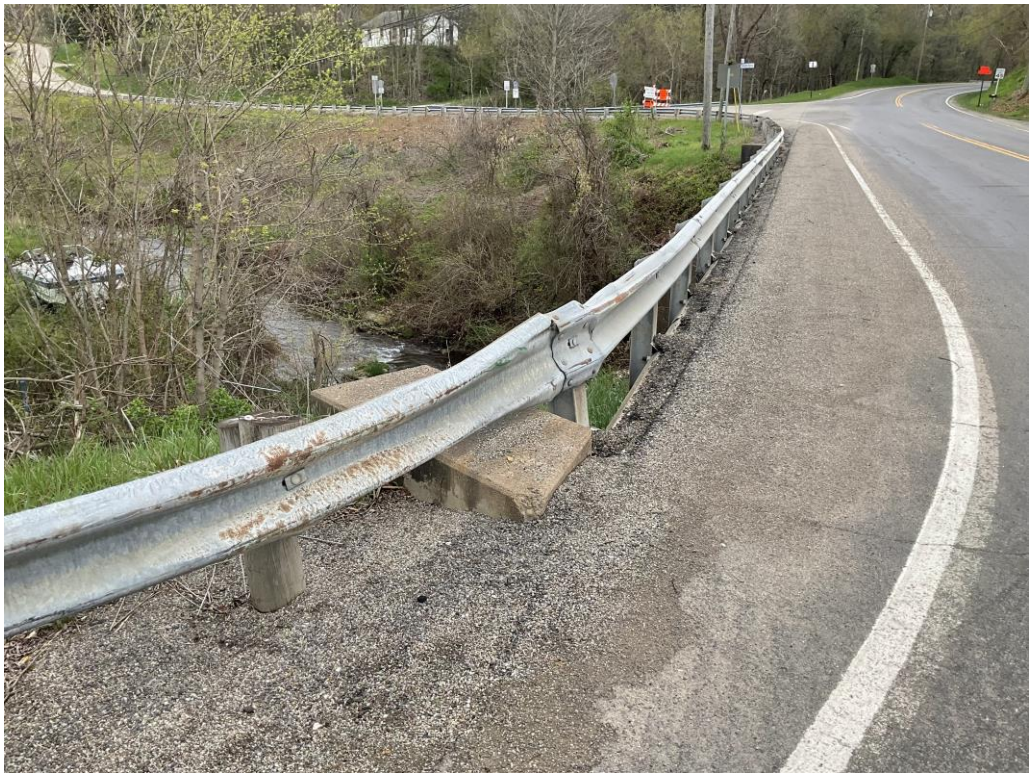
Item 60 Substructure…… 8 There is some cracking along the top of the abutment along the beam seats about 4 inches down. I would rate this a 7 for that reason.



Item 61 Channel……..8 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: Good comments in Assetwise about beam cracking.
Defect Photos: Great defect photos in Assetwise on the cracking.
Channel Photos: Great channel photos

COL-C0425-358A20_(1531689) Concrete Arch

Item 58 Deck…….. N Agreed
Item 59 Superstructure……6 Agreed
Item 60 Substructure…….7 Agreed
Item 61 Channel……..8 Agreed
Item 61.01 Scour……..7 Agreed
Item 62 Culvert……N Agreed
Item 36 Railing…… 1 1 1 1 None of the railing meets current standards. Should be coded 0 0 0 0



Item 72 Approach Alignment …….. 8 Agreed
Comments: While the comments are good, they say there is no apparent change, but we don't know the time period reference. In the steel beam bridge, the photos were 4 years old and the comments did not correlate. If not a dated photo, then a date reference in the comments would be most useful.
Defect Photos: Good photos in Assetwise
Channel Photos: Great channel photos

COL-T2204-025012_(1539876) Through Girder (coded as Slab, should be a Through Girder)

Item 58 Deck……4 Agreed
Item 59 Superstructure……4 Agreed
Item 60 Substructure…….6 Agreed
Item 61 Channel……..8 Agreed
Item 61.01 Scour……..7 Agreed
Item 62 Culvert……..N
Item 36 Railing…….. 0 1 1 1
Item 72 Approach Alignment ….6 Agreed
Comments: Good comments.
Defect Photos: Good photos in Assetwise
Channel Photos: Great channel photos

Field Review Summary:

Overall, the county is doing a good job with their bridge inspection program. Their records are complete and organized. I found their ratings to be within the parameters set by the manual. The comments could use a little more elaboration at times, with corresponding photos. The vast majority of the channel section photos are good.

PART III Office file Review

Fracture critical bridges. 9

Fracture Critical Member and Fatigue Prone Connection ID Plan.

McCORMICK RUN ROAD OVER WEST FORK OF LITTLE BEAVER CREEK
BRIDGE No. MAD-215-18
MADISON TOWNSHIP
SFN: 1536354

Bridge Load Rating Report, including Gusset plate analysis.

Same as above SFN: 1536354

Underwater inspections

None

POA for Scour

SFN 1536206 SAL # 72-17 Cunningham Road T-765 over Stone Run

Scour susceptible bridges

Columbiana County has a listing of their scour susceptible bridges. 278 with 5 being probed every year.

Critical findings

Columbiana County has had no critical findings, procedure flow chart.

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

COLUMBIANA County 2022

INVENTORY, APPRAISAL & INSPECTION SNAPSHOT

12/21/2022

Inventory Data - NBIS Bridges Only

	NBIS COUNT
NBIS Bridges > 20'	169
Bridges 10'-20'	124
All Bridges	293

Item 221 Inspection Responsibility		CODE	#NBIS	#ALL
Data Tab Col BV,BW	County	2	169	293

Item 21 Maintenance responsibility		CODE	#NBIS	#ALL
Data Tab	County	2	167	291
Col D	City or other local	4	0	0
	Railroad	27	0	0
	Private (tohter than RR)	26	2	2
	State Park	11	0	0
	Local Park	23	0	0
	State Agency	1	0	0
	Township	3	0	0
			169	293

Item 42A Type service on bridge		CODE	#NBIS	#ALL
Data Tab	Other	0	2	2
Col Q	Highway	1	166	290
	Railroad	2	0	0
	Ped/Bikeway	3	1	1
	Hwy/RR	4	0	0
	Hwy/Ped	5	0	0
			169	293

Item 42B Type service under bridge		CODE	#NBIS	#ALL
Data Tab	Other	0	0	0
Col R	Hwy w/ or w/o Ped	1	2	2
	Railroad	2	10	10
	Ped/Bkwy	3	0	0
	Hwy w/ RR	4	0	0
	Waterway	5	157	281
	Hwy/Waterway	6	0	0
	RR/Waterway	7	0	0
	Hwy/Waterway/RR	8	0	0
	Relief (for waterways)	9	0	0
			169	293

All data is complete and correct in this section.

ITEMS 43A,B,C Structure Type	Data (Col M,N,O)	CODE	#NBIS	#ALL
Other Culvert (incl frame culverts)		019	0	1
Concrete Slab		101	5	37
Concrete Tee Beam		104	8	8
Concrete Frame		107	10	51
Concrete Deck Arch		111	1	1
Concrete Culvert (incl frame culverts)		119	3	14
Concrete Continuous Slab		201	3	3
Concrete Continuous Tee Beam		204	1	1
Steel Beam or Girder		302	58	73
Steel Girder w/ Floor System		303	2	2
Steel Deck Truss		309	1	1
Steel Thru Truss (inlcudes Pony)		310	14	14
Steel Culvert (incl frame culverts)		319	6	24
Prestressed Concrete Thru Arch		502	1	1
Prestr. Conc. Cont. Box Beam/Girder Multiple		505	49	52
Prestr. Conc. Cont. Box Beam/Girder Spread		506	2	2
Timber Thru Truss (inlcudes Pony)		710	2	2
Timber Culvert (incl frame culverts)		819	2	5
Aluminum or Iron Thru Truss (inlcudes Pony)		910	1	1
			169	293

Item 92A Fracture Critical		CODE	#NBIS	#ALL
Data Tab	Requires FC Inspection	Y	**15**	n/a
Col U,V,Y	Requires FC Inspection	N	**154**	n/a
			169	n/a
	FC Switch Y/N is Blank		0	n/a

Item 113 Scour			#NBIS	#ALL
Data Tab	Bridge not over waterway	N	**12**	12
Col AA	unknown foundation	U	**0**	0
	over tidal waters	T	**0**	0
	foundations on dry land	9	**4**	4
	stable above footing	8	**147**	266
	countermeasures installed	7	**1**	2
	no scour evaluation made	6	**0**	0
	stable within footer limits	5	**5**	9
	stable action needed	4	**0**	0
	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
			169	293

All data is complete and correct in this section.

Item 63	Documented Engineering Judgment		#NBIS	#ALL
	Field Eval & Doc EJ		13	n/a
		BR_100 for these bridges?		

Item 92B	Underwater	CODE	#NBIS	#ALL
Data Tab	requires dive inspection	N	169	n/a
Col W,X,Z	requires dive inspection	Y	0	n/a
			169	

Item 709	Plan Information	CODE	#NBIS	#ALL
Data Tab	plans not avail	0	16	24
Col. AW	plan avail	1	135	250
	field measured	2	16	17
	Field Testing	3	0	0
	not applicable	N	2	2
			169	293

Item 63	Method of Analysis	CODE	#NBIS	#ALL
Data Tab	Field Eval & Doc. Engr Judgment	0	13	22
Col. AV	Work Stress	1	0	0
	LFR	2	0	0
	LRFR	3	0	0
	load test	4	0	0
	No rating done	5	3	95
	LFR	6	123	136
	AS	7	7	13
	LRFR	8	23	27
	Assigned LFR HS20	D	0	0
	Assigned LRFR HL93	F	0	0
	not appl (RR, etc)	X	0	0
			169	293

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	146	268
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	2	2
	closed for load cap. reason	K	3	3
	Posted for load capacity	P	18	20
	Posted for other than load	R	0	0
	Closed for other than load	X	0	0
			169	293

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	2
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 Qualificati (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 Qualifications are met.

METRIC 8 - Insp. Frequency Underwater						
Dive Inspections Overdue		# OVERDUE	# UW	% PASS		COMPLIANCE
Data Tab Col. Z	60 months	0	0	100.0%		(C)
METRIC 10 - Insp. Frequency FC Member						
FC Inspections Overdue		# OVERDUE	# FC	% PASS		COMPLIANCE
Data Tab Col. Y	24 months	0	15	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	0	162	100.0%		(C)
	Adequacy comments **	1	30	96.7%		(C)
		Error	Total Scour	% PASS		
Comment	Rating should be = Scour	0	152	100.0%	within tolerance +/- 1	
Tab	Noncompliant Scour Rating Er	0	152	100.0%		(C)

COL-T0742-014425_(1535978) I would have liked to see more in-depth comments on this bridge , but it was rated greater than a 5 so no comments were actually required. I am glad to see comments where ever they are warranted regardless of condition rating.

Inspector Comments - General Appraisal

Superstructure

Beams/Girders (LF)

moderate to heavy rust scale west beam ends. Some small sections of bottom flanges have approx. 50%. Monitor for future repairs.

METRIC 14 - Posting	Load rating data tab				
From Files review	# errors	#sampled	% PASS		COMPLIANCE
Op RF < 3 tons but not closed	0	169	100.0%		(C)
Op RF = 0 but not closed	0	169	100.0%		(C)
% Legal < 100 but not posted	0	169	100.0%		(C)
Item 41 = B	0	169	100.0%		(C)

There were no errors found with respect to bridge postings.

METRIC 16 - Fracture Critical Inspection	(from files examination)			
From Files review	**Missing**	**# FC**	**% PASS**	**COMPLIANCE**
Fract Critical Member ID	0	1	100.0%	(C)
Fatigue Prone Detail	0	1	100.0%	(C)
Gusset Plate Calculations	0	1	100.0%	(C)
FC Inspection Procedure	0	1	100.0%	(C)

METRIC 17 - Underwater Inspection	(from files examination)			
From Files review	**Missing**	**# UW**	**% PASS**	**COMPLIANCE**
UW Inspection Procedure	0	0	100%	(C)
Location of UW elements	0	0	100%	(C)
UW frequency identified	0	**0**	100%	(C)

There were no bridges requiring Fracture critical inspections
or underwater inspections.

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

Columbiana County is in Compliance with all metrics.