Quality Assurance Review
National Bridge Inspection Standards &
Bridge Maintenance Program
Hamilton County
April 19, 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: Hamilton County Engineer's Office

DATE: 4/5/2022

Questionnaire Completed by: Tom Brayshaw, Carter Light, Logan Kunkel

I. MAINTENANCE, REHABILITATION AND REPLACEMENT PROGRAM

A. NUMBER OF BRIDGES WITH MAINTENANCE RESPONSIBILITY

1. Greater than 20' long (NBIS length 23CFR 650c) **(Metric 22)** **252**

2. Bridges >= 10' and <= 20' long **(Metric 22)** **171**

B. PROCEDURES AND BUDGET

1. Contract repairs and replacement per year

Replacements:(Enter Number): Culverts : Bridges: 3

Rehabilitations (Enter Number): Culverts : Bridges:

Maint. Contracts (Enter Number): Culverts : Bridges:

-List approximate annual budget: **$2,000,000.00**

Are Credit Bridge funds used? ☒

Are Fed Funds used? ☒

2. In-house repairs and replacements

Replacements:(Enter Number): Culverts : Bridges:

Rehabilitations (Enter Number): Culverts : Bridges: 3

Replacements (Enter Number): Culverts : Bridges:

List approximate annual budget: $250,000.00

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

- ☒ Inspection reports.
- ☒ Sufficiency rating.
- ☒ Growth/development.
- ☐ Other…explain Click or tap here to enter text.

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

- ☒ In-house
- ☒ Consultant
- ☒ Contractor
- ☐ Other explain Click or tap here to enter text.

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

- ☒ In-house
- ☒ Contractor
- ☐ Other explain Click or tap here to enter text.

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

- ☒ Work orders
- ☒ Time Cards
- ☒ Plans

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

- ☒ Engineer?
- ☒ Sherriff?
- ☒ Commissioners?

II. INSPECTION PROGRAM

A. NUMBER OF BRIDGES WITH INSPECTION RESPONSIBILITY

1. Greater than 20’ long (NBIS length, ORC 5501.47, 5543.20) **(Metric 22)** **252**

2. Between 10’ and 20' long (ORC 5501.47, 5543.20) **(Metric 22)** **171**

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: Tom Brayshaw, PE

- Yrs. Inspection related experience: 14

- List courses attended (& approx. dates) DOT Level 1 Basic (1997 & 2020), DOT Level 2 Advanced (1997 & 2020), DOT Refresher (Online – 2020)

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

Name: Carter Light, EIT

- Yrs. Inspection related experience: 4

- List courses attended (& approx. dates) L1 & L2 Bridge Inspection Pilot Training (2021)

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

Name: Logan Kunkel, Bridge Inspector

- Yrs. Inspection related experience: 6

- List courses attended (& approx. dates) L1 & L2 Bridge Inspection Pilot Training (2021)

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

%TIME on inspections:

15 % Bridge/Culvert inspection

15 % Bridge Design/Plan prep

16 % Bridge Construction

16 % Bridge Maintenance

16 % Overload/Superloads

0 % Surveying

22 % Other -

___ % 100% on Bridges only

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

a. List Ohio PE #: 65553 b. Name: Tom Brayshaw, PE

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

- Name: Brad Walden, PE (Terracon)

- Yrs. Inspection related experience: 25 years

- List courses attended (& approx dates) NHI Course No. 130055A Safety Inspection of In-Service Bridges (2008), FHWA-NHI-130053 Bridge Inspection Refresher Training (2018), ANSI / ACDE 01-1993 Commercial Deep Sea Diver (1997).

D. INSPECTION EQUIPMENT

1. Type of vehicle used for inspections

- ☐ 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 Length ___
- ☒ 100' Fiberglass Tape
- ☒ Geologist Hammer
- ☐ Inspection Mirror
- ☒ Flashlight
- ☐ Thermometer
- ☐ Plumb Bob
- ☒ Camera
- ☒ 2'-0" Level
- ☐ Brush Hook/Axe
- ☒ Boat
- ☒ First Aid Kit
- ☐ Wire Brush
- ☒ 6' Folding Rule
- ☒ Scraper
- ☒ Vertical Clearance Rod
- ☒ Probing Rod
- ☒ Paint Stick/Crayon
- ☒ Hip Boots and Waders
- ☒ Sounding Chains
- ☐ Wrenches
- ☐ Pliers
- ☐ Screw Driver
- ☐ Shovel
- ☐ Calipers

Other equipment not listed above: Bucket Truck (signal shop)

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

☐ Dye penetrant; ☐ Magnetic particle; ☐ Ultrasound;

Other Hire Consultant as needed

5. What equipment does your team have available for "hands on" access to <u>FCM</u> bridge members? (Metric 16)

Drone, Bucket Truck, Ladder

6. Use of equipment (Metric 16) See Western Hills Viaduct documents.

a. How many bridges need a snooper?

b. How many bridges is it used on?

c. How often?

E. INSPECTION PROCEDURES

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

423

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

315

3. Average number of inspections per day (Metric 6) **7**

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

a. Beam/Girder: Simple Span: .40 hrs. Multi-span: .75 hrs.

b. Slab bridge: Simple Span: .25 hrs. Multi-span: .50 hrs.

c. Truss (pony): Simple Span: .50 hrs. Multi-span: .75 hrs.

d. Through/deck): Simple Span: .50 hrs. Multi-span: .75 hrs.

e. Culvert: Single cell .25 hrs. Multiple Cells: .40 hrs.

5. Are previous inspection reports available at site for review? (Metric 15) Yes ☒ No ☐

6. Are bridge inspections recorded in field on ☐ Paper ☒ Electronically

7. Are photos available for every bridge? Yes ☒ No ☐ **(If no, you need to start.)**

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

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

10. Are Bridge comments recorded in Assetwise? Yes ☒ No ☐ **(If no, you need to start.)**

11. Are previous bridge comments brought to the bridge? Yes ☒ No ☐ **(If no, why not)**

12. Are the bridge plans carried to the bridge site for review? (Metric 15). Yes ☐ No ☒

13. Are bridge records available for review in the bridge office? (Metric 15) Yes ☒ No ☐

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

Explain: Tom Brayshaw (Bridge Program Manager); based upon routine inspection of bridge and evaluation of its condition rating.

8. Do you have bridges requiring insp. more frequently than 12 MO Yes ☒ No ☐

15 Number due to **Damage** Six Months List frequency of inspection. **(Metric 11)**___

5-10 Number needing **In-depth** Six Months List frequency of inspection. **(Metric 11)**_____

____ Number of **Special Insp** Choose an item. List frequency of inspection. **(Metric 11)**

9. Does your inspection team believe it has enough time to do the job?

Yes ☐ No ☒

10. List your quality assurance checks made during the inspection process? (Metric 20)

Assess bridge pictures, inspection reports with supervisors and other team members. Will call CEAO/ODOT to discuss bridge reports/inspections/load ratings/funding for repairs and replace/rehab.

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

Yes ☐ No ☒ (Assetwise check)

12. Do any bridges have fracture critical inspections performed more frequently than 24-month intervals? (Metric 10)

Yes ☐ No ☒ (Assetwise check)

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

Initial Inspection? Yes ☒ No ☐

Routine Annual Inspections? Yes ☒ No ☐

Special Inspections? Yes ☒ No ☐
Underwater Inspections? Yes ☒ No ☐

Fracture Critical Inspections? Yes ☒ No ☐

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

1. No. of bridges considered scour susceptible? (Service over Water) Number 167

2. Number of bridges inspected by probing? Number 167.

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"? (Metric 18) Yes ☒ No ☐ If no, Why? Click or tap here to enter text.

5. How many structures are coded 6 on item 113 Scour Critical? (Metric 18) Number 0

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

Probing, measuring channel cross sections, visual observations, and underwater dive inspections.

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

Bridge Program Engineer/Bridge Engineer determines it by condition rating of scour, by probing, and visual observation.

G. INVENTORY

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

Who checks? Bridge Program Manager/Bridge Engineer

How Often?... ☒ 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 ☐ Less often than once per year

3. How is the inventory data input into Assetwise?

☒ 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 ☒ No ☐
Changes from new construction or rehab? Yes ☒ 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 ☒ Number__**2**___: If, No, Why not? _____ NA ☐

b. Bridges requiring underwater inspections.
Number **8** NA ☐

c. Bridges with unique or special features (i.e., pin & hanger, draw, suspension)
Number **1** NA ☐

Western Hills Viaduct concrete spalling over traffic (embedded steel member), City TROD/Consultant, as needed with bucket truck, lane closures.

Note: An examination of the files will be performed during the review.
Options: For the files listed below you can email a copy of a typical file or have them on hand for inspection.

- Bridge Files
- Scour Critical POA.
- Fracture Critical Plan.
- UW inspection Procedure

H. PROCEDURES

1. Are new maintenance problems identified during bridge inspection? (Metric 15)
Yes ☒ No ☐

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

☐ Written work order.
☒ Electronic Communication.
☐ Oral direction.
☒ Other. Explain Bridge Maintenance System

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.

☐ County Engineer ☐ Bridge Superintendent
☒ County Bridge Engineer ☐ Sherriff

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

Explain if different than procedure in Assetwise Internal Maintenance Management System.

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

Emergency repairs are noted on the inspection reports and designate it with the critical finding tab in Assetwise.

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

Bridge and Traffic Department coordinate together about sign placement.

I. LOAD ANALYSIS AND POSTING

1. Number of plans for existing bridges available for NBIS length bridges. **168**

2. Number of plans for non-NBIS bridges (>= 10' and <= 20' long) **112**

3. **Number of bridges analyzed using the *AASHTO Bridge Evaluation*** **(Metric 13)**_____
By Whom **(Metric 13)**

☒ Load Rating Engineer
☐ County Engineer
☒ Bridge Engineer
☒ Consultant

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

☐ Every 5 years regardless.
☒ When there is a significant change in condition rating.
☐ When wearing surface thickness increases more than 1-1/2 inches
☐ When permit load is requested
☐ other

5. Methods used **(Metric 13)**

☒ AAWSHTO BrR
☒ Hand Calculated
☒ Engineering Judgement (BR100)

☒ BARS or other proprietary software program
☒ Other Explain BRASS, ODOT Spreadsheet

6. Number of NBIS length bridges "not ratable" at all due to lack of data and may have to be field tested. (Metric 13) *(These are bridges that have a coding of **5**, not **0** in the method of analysis Item.)*

Number 0 Plan of action for load rating these? Click or tap here to enter text.

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

Number of bridges posted **10**. Number of bridges with posted Signs in the field **10**.

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

9. List bridges rated less than 100% Ohio legal load and not physically load posted, and resolution. (Assetwise Check) 0

10. Number of NBIS bridges with Gusset Plates (Metric 13) 2

11. Number of NBIS bridges with Gusset Plates analyzed. (Metric 13) 2

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

- Inspection reports, including old inspections:

☒ On paper file in Office
☒ Electronically
☐ In Assetwise
☐ All three
☐ Other

- Design Calculations:

☒ On paper file in Office
☒ Electronically
☐ In Assetwise
☐ All three
☐ Other

- Plans:

☐ On paper file in Office
☒ Electronically
☐ In Assetwise
☐ All three

☐ Other

- Load analysis calculations:

☒ On paper file in Office
☒ Electronically
☐ In Assetwise
☐ All three
☐ Other

- Inventory forms:

☐ On paper file in Office
☐ Electronically
☐ In Assetwise
☒ All three
☐ Other

- Photos and sketches:

☐ On paper file in Office
☐ Electronically
☐ In Assetwise
☒ All three
☐ Other

- Repairs and maintenance history

☐ On paper file in Office
☐ Electronically
☐ In Assetwise
☒ All three
☐ Other

- Scour evaluation:

☐ 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:

☐ On paper file in Office
☐ Electronically
☐ In Assetwise
☒ All three
☐ Other

- Load Posting/Closing:

☐ On paper file in Office
☐ Electronically
☐ In Assetwise
☒ All three
☐ Other

- Underwater inspections:

☒ On paper file in Office
☒ Electronically
☐ In Assetwise
☐ All three
☐ Other

- Special inspection eqpt. or procedures:

☐ On paper file in Office
☐ Electronically
☐ In Assetwise
☒ All three
☐ Other

- Flood data, waterway adequacy, channel cross sections:

☐ 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.

13. What is the FC bridge inspection frequency? (Metric 16) **Every 24 Months**

14. Is the FC Plan completed for all FC bridges? (Metric 16) **Yes ☒ No ☐**

15. Are the FCM Identified in the FC Plan? (Metric 16) **Yes ☒ No ☐**

16. What is the underwater inspection frequency? (Metric 17) ___**Every 60 Months**_____

17. Are the underwater elements identified and located? (Metric 17) **Yes ☒ No ☐**

18. List any complex bridges: (Metric 19) Western Hills Viaduct

19. Do the complex bridges require specialized inspection procedures and additional inspector training? (Metric 19)

Yes ☒ No ☐

Describe: Please refer to attached Western Hills Viaduct documents.

Other equipment not listed above: Paint gauge, Range Pole (Heights), Laser Level/Distance device, Tablet, Laptop, SmartPhone

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:

HAM-C0370-0002 _(3132854) Concrete Slab

Item 58 Deck……..6 Agreed There does not appear to be a separate deck, so the deck and superstructure should be coded the same condition.

Item 59 Superstructure……5 Agreed The % of damaged area may be approaching the 20% mark.

Item 60 Substructure…….7 Agreed

Item 61 Channel……..7 Agreed

Item 61.01 Scour……..7 Agreed

Item 62 Culvert……N

Item 36 Railing…….. 0 ~~1~~ 0 1 ~~1~~ 0 Only the type 5 Railing is up to standard.

Item 72 Approach Alignment ……..6 Agreed

Comments: Good comments, could elaborate a little more of location and severity.

Defect Photos: Defect photos in Assetwise needed to show the extent. (A picture of the entire slab bottom would be great, like the one below.)

Channel Photos: Very Good Channel Photos in Assetwise

HAM-C0358-0276 _(3132676) Concrete Frame

Item 58 Deck…….. **7** Like the first bridge, it appears that there is no deck beyond the frame slab, so it has to be rated as the super is rated.

Item 59 Superstructure……**5** Agreed Given the cracking, efflorescence and almost every bar exposed, this is rapidly approaching a 4 with the next inspection.

Item 60 Substructure…….**5** Agreed

Item 61 Channel……..**5** Agreed

Item 61.01 Scour……..**6** Agreed

Item 62 Culvert……N

Item 36 Railing……..0 N 0 0 Agreed

Item 72 Approach Alignment …….. Agreed

Comments: Very brief comments. Could use that Location Extent and Severity touch.

Defect Photos: A couple of good defect photos in Assetwise. Could use a view of the abutment spalling though, like the one above. If photos like this are in the bridge file, that is great and acceptable, but it would be nice to see one posted too.

Channel Photos: One of the Channel photos in Assetwise is pretty close to the structure and makes it difficult to see the channel approach. However, with the waterfall immediately downstream makes for a difficult shot, so no worries.

HAM-C0359-0119 _(3132684) Steel Stringer

Item 58 Deck…….. 6 Agreed

Item 59 Superstructure……6 Agreed Steel too high to check for loss of section, but looked OK from below. Rust becoming more prominent near the bearings.

Item 60 Substructure…….6 Agreed

Item 61 Channel…….. 5 Agreed

Item 61.01 Scour…….. 6 Agreed? May need to check the rear abutment when the water is down. Too deep for me to check.

Item 62 Culvert…….. **N**

Item 36 Railing …….. ~~1~~ 0 ~~1~~ ~~1~~ Bridge is at an intersection and has curbing, but the railing still doesn't meet current standards.

Item 72 Approach Alignment ……..7 Agreed

Comments: Again, need to elaborate a little more in the comments!

Defect Photos: Good Photos in general. Could use a closer one of the rusted portions of the beams. Plus, a good representative shot of the deck, like these.

Channel Photos: Channel Photos need to look more like this one, where both abutments can be seen as well as the channel banks.

HAM-C0374-0277 _(3133699) box beams

Item 58 Deck…….. 7 Agreed

Item 59 Superstructure…… 7 Agreed

Item 60 Substructure……. **5** The abutments look good, one pier is problematic. This is a difficult one to assess because the overall area is not as impacted by the spalling. The stems are clean except the ends, but the hammerhead has extensive spalling on both sides. Since the hammer head experiences a variety of high stresses, and about 75% is spalled, I am leaning toward a 4 on this pier. While that still puts them within the 1-point rule, I would remeasure the spalled areas and re-evaluate the piers with the next inspection.

Item 61 Channel……..7 Agreed

Item 61.01 Scour……..7 Agreed

Item 62 Culvert……N Agreed

Item 36 Railing…… 1 0 1 1 Agreed

Item 72 Approach Alignment …….. Agreed

Comments: Great Comments!

Defect Photos: Good Defect Photos in Assetwise

Channel Photos: Channel Photos in Assetwise are adequate for such a large bridge with a narrow channel

HAM-C0328-0017 _(3132501) Culvert

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

HAM-CLARK-0003REA_(3136248) Box beams

Item 58 Deck……..5 I think the deck and Super are one in the same. I did not detect a separate deck. The wearing surface looks to be a 5 or less.
Item 59 Superstructure……6 Agreed The beams look pretty good in spite of some leakage.
Item 60 Substructure…….5 Agreed
Item 61 Channel……..6 Agreed
Item 61.01 Scour…….. 7 Agreed
Item 62 Culvert……N Agreed
Item 36 Railing…… 0 0 0 0 Agreed
Item 72 Approach Alignment ……..8 Agreed
Comments: Good Comments
Defect Photos: Good Photos in Assetwise
Channel Photos: Good Channel Photos are difficult to obtain at this location. May need to use a drone, or take channel sections.

HAM-RIDDL-0098WOO_(3138208) Tee Beam

The Tee Beam designation may not reflect the structural nature of this bridge, as this appears to be a Double Channel Section rather than a Tee. The plans show two separate sections in a channel shape, as the deck steel is not continuous over the center legs. While the design is unusual with the cantilevered end spans, it appears that was the intent. The concrete abutment face is only a facing in front of a very old masonry abutment that supported a narrow truss prior to this bridge and most likely could not support any loading when the bridge was replaced with a wider super. This has nothing to do with the condition, only my understanding of what I am observing.

Item 58 Deck……..6 Agreed
Item 59 Superstructure……5 Agreed
Item 60 Substructure…….5 Agreed
Item 61 Channel……..6 Agreed
Item 61.01 Scour……..7
Item 62 Culvert……..N
Item 36 Railing…….. 0 0 0 0 Agreed
Item 72 Approach Alignment …. 8 Agreed
Comments: Good Comments

Defect Photos: Great defect Photos
Channel Photos: Channel Photos are very close to being complete in Assetwise.

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 rating to be well within the parameters set by the manual with the +/- 1 point allowance. The comments could use a little more elaboration at times and corresponding photos would help. Most of the channel section photos are pretty good, but some need improvement in order to capture what is needed. Note: Hamilton County has more extensive photos, and complete documentation in their office bridge files than what is posted in Assetwise.

PART III Office file Review

Fracture critical bridges 3137082; 3136582; 3134202; 3139840

Fracture Critical Member and Fatigue Prone Connection ID Plan.
Bridgepoint Road over S. Fork Taylors Cr. HAM-BRIPT-0000 _(3139840)
Western Hills Viaduct (3137082)

Bridge Load Rating Report, including Gusset plate analysis.
Bridgepoint Road over S. Fork Taylors Cr. HAM-BRIPT-0000 _(3139840)

Underwater inspections
Old Colerain over Gt. Miami River B-0404, SFN 3133516
Harrison Ave over Gt. Miami River B-0754, SFN 3133443
Lawrenceburg Rd o/ Gt. Miami River B-325, SFN 31330142

POA for Scour
Hamilton County has a POA for scour documented

Scour susceptible bridges
Hamilton County has a detailed listing of their scour susceptible bridges.

Critical findings
Hamilton County has a critical finding 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

HAMILTON County 2022

INVENTORY, APPRAISAL & INSPECTION SNAPSHOT

12/20/2022

Inventory Data - NBIS Bridges Only

	NBIS COUNT
NBIS Bridges > 20'	255
Bridges 10'-20'	162
All Bridges	417

Item 221	Inspection Responsibility	CODE	#NBIS	#ALL
Data Tab Col BV,BW	County	2	255	417

Item 21	Maintenance responsibility	CODE	#NBIS	#ALL
Data Tab	County	2	249	411
Col D	City or other local	4	0	0
	Railroad	27	5	5
	Private (tohter than RR)	26	0	0
	State Park	11	0	0
	Local Park	23	0	0
	State Agency	1	0	0
	Township	3	1	1
			255	417

Item 42A	Type service on bridge	CODE	#NBIS	#ALL
Data Tab	Other	0	0	0
Col Q	Highway	1	185	330
	Railroad	2	5	5
	Ped/Bikeway	3	2	2
	Hwy/RR	4	0	2
	Hwy/Ped	5	63	78
			255	417

Item 42B	Type service under bridge	CODE	#NBIS	#ALL
Data Tab	Other	0	3	4
Col R	Hwy w/ or w/o Ped	1	16	16
	Railroad	2	6	6
	Ped/Bkwy	3	1	2
	Hwy w/ RR	4	1	1
	Waterway	5	225	385
	Hwy/Waterway	6	0	0
	RR/Waterway	7	0	0
	Hwy/Waterway/RR	8	3	3
	Relief (for waterways)	9	0	0
			255	417

All data is complete and correct in this section.

ITEMS 43A,B,C Structure Type	Data (Col M,N,O)	CODE	#NBIS	#ALL
Other Beam or Girder		002	1	1
Concrete Slab		101	16	27
Concrete Tee Beam		104	4	5
Concrete Box Beam/Girder Multiple		105	1	1
Concrete Frame		107	15	20
Concrete Deck Arch		111	1	1
Concrete Thru Arch		112	1	1
Concrete Culvert (incl frame culverts)		119	21	110
Concrete Continuous Slab		201	6	6
Concrete Continuous Tee Beam		204	3	3
Steel Beam or Girder		302	4	4
Steel Girder w/ Floor System		303	4	4
Steel Thru Truss (inlcudes Pony)		310	1	1
Steel Culvert (incl frame culverts)		319	19	64
Steel Continuous Beam or Girder		402	30	30
Prestressed Concrete Thru Arch		502	7	7
Prestr. Conc. Cont. Box Beam/Girder Multiple		505	111	115
Prestressed Concrete Continuous Thru Arch		602	5	5
Prestr. Conc. Cont. Box Beam/Girder Multiple		605	3	3
Timber Deck Arch		811	1	1
Timber Culvert (incl frame culverts)		819	0	3
Aluminum or Iron Culvert (incl frame culverts)		919	1	5
			255	417

Item 92A Fracture Critical		CODE	#NBIS	#ALL
Data Tab	Requires FC Inspection	Y	2	n/a
Col U,V,Y	Requires FC Inspection	N	253	n/a
			255	n/a
	FC Switch Y/N is Blank			n/a

All data is complete and correct in this section.

Item 113 Scour			#NBIS	#ALL
Data Tab	Bridge not over waterway	N	27	29
Col AA	unknown foundation	U	0	0
	over tidal waters	T	0	0
	foundations on dry land	9	5	15
	stable above footing	8	98	188
	countermeasures installed	7	12	19
	no scour evaluation made	6	0	0
	stable within footer limits	5	113	166
	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
			255	417

All data is complete and correct in this section.

Item 63	Documented Engineering Judgment			#NBIS	#ALL
	Field Eval & Doc EJ			7	n/a
		BR_100 for these bridges?			

Item 92B	Underwater	CODE	#NBIS	#ALL
Data Tab	requires dive inspection	N	247	n/a
Col W,X,Z	requires dive inspection	Y	8	n/a
			255	

Item 709	Plan Information	CODE	#NBIS	#ALL
Data Tab	plans not avail	0	9	15
Col. AW	plan avail	1	238	394
	field measured	2	1	1
	Field Testing	3	0	0
	not applicable	N	7	7
			255	417

Item 63	Method of Analysis	CODE	#NBIS	#ALL
Data Tab	Field Eval & Doc. Engr Judgment	0	7	10
Col. AV	Work Stress	1	0	0
	LFR	2	0	0
	LRFR	3	0	0
	load test	4	0	0
	No rating done	5	7	43
	LFR	6	73	80
	AS	7	0	1
	LRFR	8	167	281
	Assigned LFR HS20	D	1	2
	Assigned LRFR HL93	F	0	0
	not appl (RR, etc)	X	0	0
			255	417

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.

Inspection Condition Data - NBIS Bridges Only

Item 41	Operating Status	CODE	# NBIS	# ALL
Data Tab	Open, No restriction	A	244	405
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	1	1
	Posted for load capacity	P	10	11
	Posted for other than load	R	0	0
	Closed for other than load	X	0	0
			255	417

Metric 13	Load Rating Data	
Load Rating Tab		# OF ERRORS
Col. AN	Op RF greater than Inv RF?	1
Col. AO	Posting and % Legal OK?	2
Col. AP	"0" used instead of blank	0
Col. AT	% legal <> lowest RF	32
Col.A V	Item 70 correct?	2
Col. AW	Method of Rating Alike?	1
Col. AX	Op & Inv RF in Tons as req'd?	0
Col. AY	Item 575 correct?	1
Col. AZ	Depth of fill completed?	0

HAM-C0173-0103 _(3131645)

HAM-C0176-0220 _(3131661) HAM-C0049-0024 _(3131505)

See Load rating TAB Column AT Most of these are due to the EV3 vehicle controlling

HAM-C0049-0024 _(3131505) HAM-C0205-02.711_(3131963)

HAM-C0292-0353 _(3138364)

HAM-C0393-0031 _(3134415)

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	3	100.0%	(C)
Comprehensive	0	3	100.0%	(C)
Refresher	0	3	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	8	96.9%	(SC)
Col. AB	All	Routine insp.	13		
	BIM -	18 months	0	100.0%	(C)

See DATA TAB Column CA Yellow Highlights

All other data is complete and correct in this section.

METRIC 8 - Insp. Frequency Underwater						
Dive Inspections Overdue		# OVERDUE	# UW	% PASS		COMPLIANCE
Data Tab Col. Z	60 months	0	8	100.0%		(C)
METRIC 10 - Insp. Frequency FC Member						
FC Inspections Overdue		# OVERDUE	# FC	% PASS		COMPLIANCE
Data Tab Col. Y	24 months	0	2	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	3	119	97.5%		(C)
	Adequacy comments **	1	49	98.0%		(C)
		Error	Total Scour	% PASS		
Comment	Rating should be = Scour	10	111	91.0%	within tolerance +/- 1	
Tab	Noncompliant Scour Rating Err	3	111	97.3%		(C)

HAM-C0330-4762 _(3136817) HAM-C0358-0276 _(3132676) HAM-C0392-0046 _(3133125)

See Comments TAB for details. Remember Scour controls Substructure and Culvert ratings.
See Comments TAB for details. Scour rating 2 or more points below Substructure or Culvert rating

METRIC 14 - Posting	Load rating data tab				
From Files review	# errors	#sampled	% PASS		COMPLIANCE
Op RF < 3 tons but not closed	0	255	100.0%		(C)
Op RF = 0 but not closed	0	255	100.0%		(C)
% Legal < 100 but not posted	1	255	99.6%		(SC)
Item 41 = B	0	255	100.0%		(C)
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	3	100.0%		(C)
Location of UW elements	0	3	100.0%		(C)
UW frequency identified	0	3	100.0%		(C)

HAM-C0049-0024 (3131505) See Column AO

See Columns S & T in Load rating TAB

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

*Based on Questionnaire and office file review

Metric	Action Needed

Hamilton County has some data entry clean-up to perform in order to become fully compliant. They also need to catch up on some inspections that are overdue.