

2020 Quality Assurance Review Bridge Inspection Program

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.

Instructions for completing form: Please fill out checklist prior to scheduled review. Brief answers are desired; fill the items out to the best of your ability.

Agency Reviewed: Washington County Engineer

Checklist completed by: Roger Wright P.E., P.S. Date: 7/27/2020

I. MAINTENANCE, REHABILITATION AND REPLACEMENT PROGRAM

A. NUMBER OF BRIDGES WITH MAINTENANCE RESPONSIBILITY

1. Greater than 20' long (NBIS length 23CFR 650c) 215
2. Bridges \geq 10' and \leq 20' long 163

B. PROCEDURES AND BUDGET

1. Contract repairs and replacement
 - List typical work items: Replacement, Deck Rehab/Replacement, Painting
 - List approximate annual budget: \$500,000.00 to \$750,000.00
 - Are Fed Funds used? Yes
 - Are Credit Bridge funds used? Yes
2. In-house repairs and replacements
 - List typical work items: Steel Beam Repair, Concrete Repair, Waterproofing and Paving.
 - List approximate annual budget: \$35,000.00
 - List staffing availability: 5
3. How are projects identified and selected? Bridge inspection notes and most critical
4. How are plans developed for emergency repairs? In house staff or contract

5. Who does the work of emergency repairs? **In house staff or contract**
6. How is repair work documented? (i.e. work record, time card)
Work record
7. Who is empowered to order emergency road closures and how is it done?
Roger Wright, Bridge inspectors Tim January & Kurt Zimmer and any Foreman if imminent danger is present. Program Manager & Team Leader(s) are notified of the bridge deficiency, if a decision is made to close the bridge the Sheriff's Office is contacted to notify emergency response of the road closure.

II. INSPECTION PROGRAM (ASSET WISE Data will be utilized)

A. NUMBER OF BRIDGES WITH INSPECTION RESPONSIBILITY

1. Greater than 20' long (NBIS length, ORC 5501.47, 5543.20) **215**
2. Between 10' and 20' long (including 10' & 20') (ORC 5501.47, 5543.20) **163**

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: **Roger Wright P.E, P.S.**
- Yrs. Inspection related experience: **20+**
- List courses attended (& approx dates) **Bridge Inspection Level 1&2, 2000; Scour Assessment of Bridges, 2008; Stream Stability and Scour at Bridges for Bridge Inspection, 2009; SMS Training, 2013; Element Level Bridge Inspection Training, 2016;**

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

(Metric 1)

- Name: **Roger Wright P.E, P.S.**
- Yrs. Inspection related experience: **20+**
- List courses attended (& approx dates) **Bridge Inspection Level 1&2, 2000; Scour Assessment of Bridges, 2008; Stream Stability and Scour at Bridges for Bridge Inspection, 2009; SMS Training, 2013; Element Level Bridge Inspection Training, 2016;**

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

(Metric 1&3)

- Name: Tim January, AAS Industrial/Design Drafting, 30 years Construction experience

- Yrs. Inspection related experience: 19+

- List courses attended (& approx dates) Bridge Inspection Comprehensive Level 1&2, 2001; Field Painting of Structural Steel, 2005; Culvert Inspection, 2006; Scour Assessment of Bridges, 2008; Stream Stability and Scour at Bridges for Bridge Inspection, 2009; ODOT Manual of Inspection Update, 2011; SMS Training, 2013; Element Level Bridge Inspection Training, 2016; Bridge Inspection Refresher Course, 2018.

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

%TIME

<u>20</u>	Bridge/Culvert inspection	<u>5</u>	Surveying
<u>60</u>	Bridge Design/Plan prep	<u> </u>	Other -
<u>5</u>	Bridge Construction	<u> </u>	100%
<u>5</u>	Bridge Maintenance		
<u>5</u>	Overload/Superload		

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

(Metric 1&3)

- Name: Kurt Zimmer, BS Civil Engineering EIT

- Yrs. Inspection related experience: 3

- List courses attended (& approx dates) Bridge Inspection Level 1, 2017; Bridge Inspection Level 2, 2017

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

%TIME

<u>30</u>	Bridge/Culvert inspection	<u>5</u>	Overload/Superload
<u>30</u>	Bridge Design/Plan prep	<u>15</u>	Surveying
<u>10</u>	Bridge Construction	<u>5</u>	Other -
<u>5</u>	Bridge Maintenance	<u> </u>	100%

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

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

a. List Ohio PE # Roger Wright PE 69320 or Contract

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

- Name: Contract

- Yrs. Inspection related experience: _____

- List courses attended (& approx dates) _____

C. INSPECTION EQUIPMENT

1. Type of vehicle used for inspections

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

	Yes/No		
Extension Ladder	<u>Y</u>	First Aid Kit	<u>Y</u>
what length?	<u>24</u>	Wire Brush	<u>Y</u>
6' Folding Rule	<u>Y</u>	Calipers	<u>Y</u>
100' Fiberglass Tape	<u>Y</u>	Shovel	<u>Y</u>
Geologist Hammer	<u>Y</u>	Screw Driver	<u>Y</u>
Inspection Mirror	<u>N</u>	Pliers	<u>Y</u>
Flashlight	<u>Y</u>	Wrenches	<u>Y</u>
Thermometer	<u>N</u>	Sounding Chains	<u>Y</u>
Plumb Bob	<u>Y</u>	Hip Boots and Waders	<u>Y</u>
Camera	<u>Y</u>	Paint Stick/Crayon	<u>Y</u>
2'-0" Level	<u>Y</u>	Scraper	<u>Y</u>
Brush Hook/Axe	<u>Y</u>	Probing Rod	<u>Y</u>
Boat	<u>Y</u>	Vertical Clearance Rod	<u>Y</u>

3. List types of NDT methods used (IE. dye penetrant, magnetic particle, ultrasound)

Sounding with hammer, Sounding Chain, Visual and Measure, Contract if needed

4. How is usage determined?

Location and member type

5. List additional items

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

Ladder and Climbing/Fall Arrest Equipment, Contract if needed

7. Use of equipment (Metric 16)

- a. How many bridges need a snooper? 2 large structures a snooper performs a more in depth inspection than normal visual inspection due to the size and height above stream making visual inspection challenging.
- b. How many bridges is it used on? 2
- c. How often? Varies, 5 year maximum a contract inspection via snooper is performed for the 2 large structures.

D. INSPECTION PROCEDURES

1. Approximately how many inspections were made during last calendar year? (Metric 6)
378

2. Approximately how many inspections are scheduled for the current calendar year?

(Metric 6)

378

3. Average number of inspections per day (Metric 6) 15-20

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

- a. Beam/Girder 0.5-1.0
- b. Slab 0.5-1.0
- c. Truss (pony/through/deck) 1-2
- d. Culvert 0.5-1.0

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? Please describe: Both, we have a paper BR-86 and Excel Spreadsheet and then entered into Asset wise at the office. 2020 the County started using asset wise with an i-pad

Are photos available for every bridge? (Yes X No ___)

Are photographs taken of defects during inspection? (Yes Y No ___)

Are Bridge comments recorded? (Yes Y No ___) Where? Paper copy of BR-86, Laptop and Asset Wise

Are bridge comments brought to the bridge? (Yes Y No ___)

6. Are the bridge plans carried to the bridge site for review if necessary or are they readily available for review in the bridge office? (Metric 15)

a. Bridge site (Yes ___ No X)

b. Bridge office (Yes X No ___)

7. Who determines the need for a routine inspection frequency greater than once Annually, and what criteria is used? (Metric 6) **County Engineer, the severity of deterioration, location of deterioration, traffic volume and type of traffic all factor in to determining the need for additional inspections.**

8. List bridges requiring inspection more frequently than one year intervals (DAMAGE, IN-DEPTH, SPECIAL INSPECTIONS). List frequency of inspection. (Metric 11)
None

9. Does the inspection team believe it has enough time to do the job?
(Yes X No ___)

10. What kinds of quality assurance checks are made of the inspection process? (Metric 20)
Both inspectors enter from different sides of the bridge, cross underneath and continue to inspect the entire structure and then compare comments. An outside consultant performs QA/QC inspections on random bridges with the County comparing previous inspection to consultant inspection.

11. Do any bridges have underwater inspections done in less than 60 month intervals? (Metric 8)
No

12. Have all bridges requiring underwater inspections been inspected in 60 month intervals?
(Metric 8)
Yes

13. Do any bridges have fracture critical inspections done in less than 24 month intervals? (Metric 10)
Yes, T-75-0001 fracture critical inspection performed yearly

14. Have all bridges requiring fracture critical inspections been inspected in 24 month intervals?
(Metric 10)
Yes

15. 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 ___) Except Consultant led inspections

Underwater Inspections? (Yes ___ No X) Consultant performed

Fracture Critical Inspections? (Yes ___ No X) Consultant performed

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

1. How many bridges are considered scour susceptible? (Type of Service over Water)
369

2. How many bridges are inspected by probing? **All that can be that are over water**

3. How many structures are Scour Critical (item 113 - 3, 2, 1 or 0)? (Metric 18) **None**

4. Are Plans of Action (POA) complete and implemented for all bridges coded "Scour Critical"? (Metric 18) **Yes**

5. How many structures are coded 6 on item 113 Scour Critical? (Metric 18) **None**

6. How are scour evaluations performed? (Metric 18) **Plan review and visual inspection**

7. Who determines the need for diving inspections and by what criteria?
Roger Wright and historical records of piers and abutments along with accessibility

F. INVENTORY

1. What kinds of inventory quality assurance checks are performed? (Metric 22)
SMS inventory data exported and reports created for review

2. How often is the inventory checked for needed updates? (Metric 22)
After a major rehab project, load rating completion and during inspections

3. How is the inventory data input into the system? **Asset Wise program**

4. When is the updated inventory data forwarded to ODOT? (Metric 23)
When asset wise is updated ODOT is updated automatically

Changes discovered during inspection? **Inspection data entered into Asset Wise for annual inspection.**

Changes from new construction or rehab? **All new construction or rehab bridges are updated per the ODOT bridge inspection manual timeline into the Asset Wise system.**

5. NBIS requires that the inspecting organization maintain master lists of the following:
(Provide a list of these bridges) (Metric 16,17,11)

****All required lists are contained within the Bridge Binder located in the File Room**

- 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)
- b. Bridges requiring underwater inspections
- c. Bridges with unique or special features (i.e., pin & hanger, draw, suspension)

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

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

G. PROCEDURES

1. Are new maintenance problems identified during bridge inspection?
(Y N) (Metric 15)

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

Written comments during inspection utilized to create a maintenance report, oral as needed and on site review as required

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

Roger Wright-County Engineer & Highway Superintendent

How is this emergency action documented?

Critical finding report and in house communication to correct deficiency

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

If found during routine inspection it is noted on the inspection report, if found by other means then a separate document is created.

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

Bridge Inspection Team Leaders during annual inspection and the sign maintenance employee is provided a list yearly of all posted structures to document proper sign placement in the field

H. LOAD ANALYSIS AND POSTING

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

TBD 85-90%

2. Number of plans for non-NBIS bridges ($\geq 10'$ and $\leq 20'$ long)

TBD 80-90%

3. Number of bridges analyzed in accordance with the *AASHTO Manual for Bridge Evaluation* (Metric 13)

378

4. By Whom (Metric 13) **Contract or In house**

5. When **2012 All NBIS bridges were load rated, 2012 to present load ratings were updated as required**

6. Methods used (Metric 13) **BARS PC, BRASS, STAAD, AASHTOWare BRR Rating**

7. When are bridges rerated and how do load raters keep up with overlays and other changes? (Metric 13)

Re-rated when conditions change. As overlay plans are developed bridges on those routes are evaluated for milling or an increase of wearing course thickness. If additional wearing course is to be added the bridge is noted for load rating evaluation and re-rating. Typically bridges are milled such that additional wearing course is not added.

8. Number of NBIS length bridges not load rated (Metric 13) **None**

9. List the NBIS length bridges considered "not ratable" including reason for being considered "not ratable" (Metric 13) **None**

10. Number of NBIS length bridges load posted (Metric 14) **20**

11. How determined (engineering judgment, analysis, mix) **Mix**

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

T-570-0015-PA Shinn Covered Bridge

C-804-0366-BA Deming Bridge – Bridge Closed due to bridge deck deficiency and concrete bridge deck removal

T-921-0005-LA Hune Covered Bridge – Closed due to landslip activity threatening the forward pier and left forward approach slipped and impassable

13. List bridges rated less than 100% Ohio legal load and not physically load posted, and resolution **None**

14. Number of NBIS bridges with Gusset Plates (Metric 13) **18**

15. Number of NBIS bridges with Gusset Plates analyzed. (Metric 13) **18**

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

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

All files are kept in the file room organized by County Route number low to high and log point of the structure and Township Route number low to high and log point of the structure with all applicable data above within the individual bridge file. Bridge load ratings and inspections are located in blue file folders, fracture critical information located in red file folders. Bridge plans are also filed within the bridge plan room when plans are available and in large size format.

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.

17. What is the FC bridge inspection frequency? (Metric 16) **24 months**

18. Is the FC Plan completed for all FC bridges? (Metric 16) (Yes **X** No ___)

19. Are the FCM Identified in the FC Plan? (Metric 16) (Yes **X** No ___)

20. What is the underwater inspection frequency? (Metric 17) **60 months**

21. Are the underwater elements identified and located? (Metric 17) (Yes **X** No ___)

22. List any complex bridges: (Metric 19) **None**

23. Do the complex bridges require specialized inspection procedures and additional inspector training? (Metric 19) (Yes ___ No ___)

Describe: **n/a**

I. RECOMMENDED PRACTICES

This area of the report should list any innovative ideas that provide valuable support and process improvement for offices across the State. For example: It creates a safer work environment, deploys resources efficiently, maximizes available resources, is measurable etc.

Fracture Critical Bridges

FILE CABINET & DRAWER	SFN	ROUTE	LOG PT	TWP	FEATURED INTERSECTION	V069 NBIS	FRAC. CRIT. INSP.	POST (TONS)	LOAD RATING DATE	GOVERNING MEMBER
H-2	8430519	C0020	0658	MA	L MUSKINGUM * CORNERVILLE	Y	Y24092519	EV: 29, 41	12/17/2018	FLOOR BEAMS
H-3	8430624	C0076	0095	AD	CATS CREEK * WICKENS	Y	Y24092319	None	1/7/2019	FLOOR SYSTEM
H-1	8431558	C0016	0324	FE	KILLWELL RUN * DUCKWORTH	Y	Y24092519	EV: 29, 33	9/11/2018	FLOOR BEAMS
K-1	8435006	T0074	0001	AU	DUCK CREEK * JACKSON	Y	Y24092319	None	10/2/2019	Truss Lower Chord
K-1	8435014	T0075	0001	AU	DUCK CREEK * STEVENS	Y	Y24092319	15,15,16,18,18, 28	10/7/2017	SECTION LOSS TO LOWER GUSSET PLATES
K-3	8436045	T0200	0086	WE	W BR WOLF CK * BOWMAN	Y	Y24092319	None	10/7/2019	Fascia Stringers
L-1	8437416	T0289	0030	BE	L HOCKING * MILLBRANCH	Y	Y24092519	None	9/11/2018	FLOOR BEAMS
K-4	8437548	T0246	0228	BE	W L HOCKING * TWINSPAN	Y	Y24092619	None	LARGE TRUSS	FLOOR BEAMS AND TRUSS, SPAN 1
H-3	8439451	C0042	0147	FE	DUCK CREEK * STANLEYVILLE	Y	Y24092519	None	10/15/2019	FLOOR BEAMS
I-1	8403783	C0124	0423	BE	LITTLE HOCKING RIVER	Y	Y24092619		Load rating last completed in 2010 by Omar at ODOT	GUSSETS
G-3	8430330	C0009	0387	NE	EIGHTMILE CK * EIGHTMILE	Y	Y24081418	None	10/21/2018	STRINGERS
I-1	8431760	C0111	0465	DE	L HOCKING * MARTIN	Y	Y24081518	15,23,27,29,30, 40	9/5/2017	GUSSETS
J-1	8432023	T0019	0545	NE	NEWELLS RUN * MILLER#1 NE	Y	Y24081418	15,20,21,23,24, 35	9/5/2017	FLOOR BEAMS
K-1	8432619	T0066	0025	GR	MILL CREEK * ALLOWAY	Y	Y24081418	15,23,25,27,28, 40	9/5/2017	FLOOR BEAMS
J-1	8433682	T0019	0009	LA	L MUSKINGUM * COW RUN	Y	Y24081518	15,23,27,29,29, 40	9/11/2018	FLOOR BEAMS AND TRUSS
L-1	8434743	T0324	0020	SA	PAWPAW CK * SCHOFFIELD	Y	Y24081418	EV: 27, 30	10/21/2018	STRINGERS
J-3	8434980	T0038	0195	SA	E FK DUCK CK *LOWER SALEM	Y	Y24081418	EV: 29, 30	10/21/2018	STRINGERS OR GUSSETS
L-4	8435081	T0761	0007	AU	DUCK CREEK * U MACKSBURG	Y	Y24081418	EV: 29, 34	9/11/2018	FLOOR BEAMS

Bridges Requiring Dive Inspections

	Bridge Number	Bridge Name	Struct. File #	Length ft	Units in Water	Depth of Water ft	NBIS
1	C-0-0000 PI	Putnam	8430128	686	2 Piers	15-18	X
2	C-60-0625 AD	Lowell T Bridge	8433127	825	5 Piers	16-18	X
3	C-124-0423 BE	Inverted Truss	8403783	267	2 Piers	5-7	X
4	C-805-0006 DU	Veto Lake	8431515	107	2 Piers	4-6	X
5	T-37-0710 LA	Henthorn	8433844	33	2 Abutments	6-10	X
6	T-66-0025 GR	Alloway	8432619	51	2 Abutments	5	X
7	T-443-0037 NE	Mud Lane	8432082	91	2 Piers	10-12	X