

## **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: Hocking County Engineers Office

Checklist completed by: William R Shaw / Randall R Keyes Date: 10/01/2019

### ***I. MAINTENANCE, REHABILITATION AND REPLACEMENT PROGRAM***

#### **A. NUMBER OF BRIDGES WITH MAINTENANCE RESPONSIBILITY**

1. Greater than 20' long (NBIS length 23CFR 650c) (Metric 22) 196
2. Bridges  $\geq 10'$  and  $\leq 20'$  long (Metric 22) 64

#### **B. PROCEDURES AND BUDGET**

1. Contract repairs and replacement
  - List typical work items - Large Bridge Replacements
  - List approximate annual budget - 2.4 Million over 6 years
  - Are Fed Funds used? – Yes, Large Structures only
  - Are Credit Bridge funds used? - No
2. In-house repairs and replacements
  - List typical work items – Pre-casting, Erection, and Replacement
  - List approximate annual budget – 400,000
  - List staffing availability – Six People, increase or decrease as needed.
3. How are projects identified and selected? – Five year plan as a guide, may change as condition warrants.

4. How are plans developed for emergency repairs? – In House. Direction given to crews by the county Engineer.
5. Who does the work of emergency repairs? – County Bridge Crew
6. How is repair work documented? (i.e., work record, time card) – Daily Work Records
7. Who is empowered to order emergency road closures and how is it done? – County Engineer / Administrative assistant. Closure is done by Sign Crew.

**II. INSPECTION PROGRAM** (SMS Data will be utilized)

**A. NUMBER OF BRIDGES WITH INSPECTION RESPONSIBILITY**

1. Greater than 20' long (NBIS length, ORC 5501.47, 5543.20) (Metric 22) -196
2. Between 10' and 20' long (including 10' & 20') (ORC 5501.47, 5543.20) (Metric 22) - 64

**B. STAFFING**

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

(Metric 1&2)

*Doug Dillon*

- Name: William ~~R~~ Shaw County Engineer
- Yrs. Inspection related experience: \_\_\_\_\_
- List courses attended (& approx. dates) \_\_\_\_\_

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

(Metric 1)

- Name: Douglas L Dillon PE, PS
- Yrs. Inspection related experience: 12
- List courses attended (& approx. dates) 3 Day Class fall 1988, refresher class 1994, ODOT Advanced Structures 2006, Refresher 5/02/2019, LRFD Concrete, Refresher 5/09/2019

*ODOT level 1 + 2 in 1990's*

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

(Metric 1&3)

- Name: Randall R Keyes
  - Yrs. Inspection related experience: 34 years
  - List courses attended (& approx. dates) - 3 Day ODOT Classes, 1985, 1987, 1989, 1991, 1993, 1995, 1997, 1998, 2001, Load Rating BARS PC & BRASS 2008, Stream Stability and Scour at Highway Bridges 2009, Scour at Highway Bridges 2009, Stream Stability Factors and concepts 2009, Bridge Inspection level 2 2011, Element Level Bridge Inspection 2016 ✓
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- Indicate the percentage of time spent on the listed duties in the previous year

%TIME

90%	Bridge/Culvert inspection	_____	Surveying
_____	Bridge Design/Plan prep	10%	Other -
_____	Bridge Construction	_____	100%
_____	Bridge Maintenance		
_____	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: \_\_\_\_\_
  - Yrs. Inspection related experience: \_\_\_\_\_
  - List courses attended (& approx. dates) \_\_\_\_\_
- 
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- Indicate the percentage of time spent on the listed duties in the previous year

%TIME

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

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

(Metric 1&3)

- Name: \_\_\_\_\_
  - Yrs. Inspection related experience: \_\_\_\_\_
  - List courses attended (& approx dates) \_\_\_\_\_
- 
- 

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

%TIME

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

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

(Metric 1&3)

- Name: \_\_\_\_\_
  - Yrs. Inspection related experience: \_\_\_\_\_
  - List courses attended (& approx. dates) \_\_\_\_\_
- 
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- Indicate the percentage of time spent on the listed duties in the previous year

%TIME

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

7. **Team Member** of bridge inspection team ( Include information for each additional team member – copy and paste as needed). List qualifications/yrs. experience (bridge inspection experience)

- Name: \_\_\_\_\_
- Yrs. Inspection related experience: \_\_\_\_\_
- List courses attended (& approx. dates) \_\_\_\_\_

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

%TIME

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

8. **Team Member** of bridge inspection team (Include information for each additional team member – copy and paste as needed). List qualifications/yrs. experience (bridge inspection experience)

- Name: \_\_\_\_\_  
- Yrs. Inspection related experience: \_\_\_\_\_  
- List courses attended (& approx. dates) \_\_\_\_\_

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

%TIME

_____ Bridge/Culvert inspection
_____ Bridge Design/Plan prep
_____ Bridge Construction
_____ Bridge Maintenance

9. **Team Member** of bridge inspection team ( Include information for each additional team member – copy and paste as needed). List qualifications/yrs. experience (bridge inspection experience)

- Name: \_\_\_\_\_  
- Yrs. Inspection related experience: \_\_\_\_\_  
- List courses attended (& approx. dates) \_\_\_\_\_

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

%TIME

_____ Bridge/Culvert inspection
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- \_\_\_\_\_ Bridge Design/Plan prep
- \_\_\_\_\_ Bridge Construction
- \_\_\_\_\_ Bridge Maintenance

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

a. List Ohio PE # 43706 William R Shaw b.58839 Douglas L Dillon

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

- Name: N/A
- Yrs. Inspection related experience: N/A
- List courses attended (& approx. dates) N/A

**C. INSPECTION EQUIPMENT**

1. Type of vehicle used for inspections 2016 Ford F-250 4x4

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

	Yes/No		
Extension Ladder	Y	First Aid Kit	Y
What length?	20'	Wire Brush	Y
6' Folding Rule	Y	Calipers	Y
100' Fiberglass Tape	Y	Shovel	Y
Geologist Hammer	Y	Screw Driver	Y
Inspection Mirror	Y	Pliers	Y
Flashlight	Y	Wrenches	Y
Thermometer	N	Sounding Chains	N
Plumb Bob	Y	Hip Boots and Waders	Y
Camera	Y	Paint Stick/Crayon	Y
2'-0" Level	Y	Scraper	Y
Brush Hook/Axe	Y	Probing Rod	Y
Boat	N	Vertical Clearance Rod	N

3. List types of NDT methods used i.e., dye penetrant, magnetic particle, ultrasound)

4. How is usage determined?

5. List additional items (I have used a flasher type sonar unit around piers for scour)

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

7. Use of equipment (Metric 16)

- a. How many bridges need a snoopers? We can access with ladders although the snoopers makes it much easier and safer.
- b. How many bridges is it used on? 3 Bridges were inspected in 2017
- c. How often? First time 2017

**D. INSPECTION PROCEDURES**

1. Approximately how many inspections were made during last calendar year? (Metric 6)-  
260 plus 2 follow up inspections

2. Approximately how many inspections are scheduled for the current calendar year?  
(Metric 6) -0

3. Average number of inspections per day (Metric 6) This calendar year - 4.1

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

- a. Beam/Girder 1 hr.
- b. Slab 1 hr.
- c. Truss (pony/through/deck) N/A
- d. Culvert Newer box type culverts ½ hr.

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

Are bridge inspections recorded in field on paper or electronically? Please describe: Hard copy of form taken to each bridge. Notes and corrections made in field.

Are photos available for every bridge? (Yes  No  )

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

Are Bridge comments recorded? (Yes  No  ) Where? SMS and Inspection report form

Are bridge comments brought to the bridge? (Yes  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  )

b. Bridge office (Yes  No )

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

8. List bridges requiring inspection more frequently than one year intervals (DAMAGE, IN-DEPTH, SPECIAL INSPECTIONS). List frequency of inspection. (Metric 11)

9. Does the inspection team believe it has enough time to do the job? (Yes  No ) Working part time (< 30 hrs. per week) there is little down time.

10. What kinds of quality assurance checks are made of the inspection process? (Metric 20) County Engineer reviews all Inspections

11. Do any bridges have underwater inspections done in less than 60 month intervals? (Metric 8) N/A

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

13. Do any bridges have fracture critical inspections done in less than 24 month intervals? (Metric 10) N/A

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

15. 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 )

In-Depth Inspections? (Yes  No )

Underwater Inspections? (Yes  No ) N/A ✓

Fracture Critical Inspections? (Yes  No ) N/A ✓

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

1. How many bridges are considered scour susceptible? (Type of Service over Water) 259

2. How many bridges are inspected by probing? 259



3. How many structures are Scour Critical (item 113 - 3, 2, 1 or 0)? (Metric 18) 0
4. Are Plans of Action (POA) complete and implemented for all bridges coded "Scour Critical"? (Metric 18) N/A
5. How many structures are coded 6 on item 113 Scour Critical? (Metric 18) 0
6. How are scour evaluations performed? (Metric 18) All Bridges over water are evaluated for scour during the inspection.
7. Who determines the need for diving inspections and by what criteria? All structures are in less than 5 feet of water and are checked by probing.

## F. INVENTORY

1. What kinds of inventory quality assurance checks are performed? (Metric 22) Checked during the inspection process. QAR and ODOT
2. How often is the inventory checked for needed updates? (Metric 22)  
After Bridge work and during the inspection process. Data entry. Within 180 days. ✓
3. How is the inventory data input into the system? SMS
4. When is the updated inventory data forwarded to ODOT? (Metric 23)  
Changes discovered during inspection? Within 180 days of Inspection. ✓  
Changes from new construction or rehab? ASAP after the work is complete.
5. NBIS requires that the inspecting organization maintain master lists of the following: (Provide a list of these bridges) (Metric 16,17,11)  
N/A
  - 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 on the bridge inspection form? Yes

(Y\_X\_N\_\_\_) On another form? (Yes X \_\_\_ No) (Metric 15)  
Maintenance items are included in the annual inspection report.

2. How do the inspectors inform maintenance personnel of routine bridge maintenance problems (written, oral, and other)? (Metric 15) Written & email. Very minor items may be oral but not normally.

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

How is this emergency action documented? Documented in the office. Office tracks time location and materials used. I note on the inspection form comments especially if it involves Scour countermeasures.

*Use SMS Critical Findings Report*

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

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

## H. LOAD ANALYSIS AND POSTING

1. Number of plans for existing bridges available for NBIS length bridges 192

2. Number of plans for non-NBIS bridges ( $\geq 10'$  and  $\leq 20'$  long) 29

3. Number of bridges analyzed in accordance with the *AASHTO Manual for Bridge Evaluation* (Metric 13) 221

4. By Whom (Metric 13) Engineer, Consultants, and Inspector

5. When - Within the last 10 years

6. Methods used (Metric 13) - Spreadsheets, BARS, AASHTO program.

7. When are bridges rerated and how do load raters keep up with overlays and other changes? (Metric 13) Engineer determines need due to damage, deterioration.

8. Number of NBIS length bridges not load rated (Metric 13) -4

9. List the NBIS length bridges considered "not ratable" including reason for being considered "not ratable" (Metric 13)  
3730646 3731057 3732266 3734005, WPA Bridges no plans available.

10. Number of NBIS length bridges load posted (Metric 14) - 0

11. How determined (engineering judgment, analysis, mix)
12. List bridges closed due to condition rating (rough check) N/A
13. List bridges rated less than 100% Ohio legal load and not physically load posted, and resolution N/A
14. Number of NBIS bridges with Gusset Plates (Metric 13) -0
15. Number of NBIS bridges with Gusset Plates analyzed. (Metric 13) N/A
16. Describe filing system (where files are kept): (Metric 15)

- Inspection reports, including old inspections - Inspectors office
- Design Calculations – Engineers office
- Plans – Engineers office
- Load analysis calculations – Engineer and Inspectors office
- Inventory forms - Inspectors office
- Photos and sketches - Inspectors office on computer and flash drive
- Repairs and maintenance history – Superintendents office
- Scour evaluation - Inspectors Office
- Scour POA – Inspectors office
- Fracture Critical File N/A
- Load Posting/Closing N/A
- Underwater inspections N/A
- Special inspection eqpt. or procedures With load ratings – Engineers office
- Flood data, waterway adequacy, channel cross sections – Engineers office

**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 \_\_\_ No \_\_\_) N/A ✓
19. Are the FCM Identified in the FC Plan? (Metric 16) (Yes \_\_\_ No \_\_\_) N/A ✓
20. What is the underwater inspection frequency? (Metric 17) ~~72~~<sup>60</sup> Months
21. Are the underwater elements identified and located? (Metric 17) (Yes \_\_\_ No \_\_\_) N/A ✓
22. List any complex bridges: (Metric 19) N/A

23. Do the complex bridges require specialized inspection procedures and additional inspector training? (Metric 19) (Yes \_\_\_ No \_\_\_) N/A

Describe:

## **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.