2019 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: Fairfield County Engineer's Office

Checklist completed by: Jennifer Donley Date: September 8, 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)** 235

2. Bridges >= 10' and <= 20' long **(Metric 22)** 110

B. PROCEDURES AND BUDGET

1. Contract repairs and replacement
   - List typical work items: bridge replacements, bridge rehabilitations, major repairs
   - List approximate annual budget Approximately $500,000
   - Are Fed Funds used? Yes
   - Are Credit Bridge funds used? Yes

2. In-house repairs and replacements
   - List typical work items: bridge replacements, bridge rehabilitations, major repairs
   - List approximate annual budget Approximately $100,000
   - List staffing availability Bridge Crew consisting of 1 Supervisor and 3-5 Road Workers

3. How are projects identified and selected?

Bridge Replacements: Potential bridge replacement projects are identified by bridge condition, bridge load rating, and whether a bridge is functionally obsolete. The main criteria used for bridge replacement selection is the bridge condition. The secondary criteria is whether a bridge is load rated or functionally obsolete.

Bridge Repairs: Potential bridge repair projects are identified during the annual bridge inspections. Bridge repair projects are prioritized based upon potential structural failure, safety of roadway, ensuring longevity of bridge structure, and maintaining waterway adequacy.

4. How are plans developed for emergency repairs? The plan developed for repairs varies upon the extent of repairs needed and the type of repairs needed. Repairs are done by county forces under the direct supervision of the Program Manager or by contract from plans/specifications developed under the direct supervision of the Program Manager.

5. Who does the work of emergency repairs? Depending upon the extent of repairs needed and the type of repairs needed, they are done by county forces, contractors, or by a combination of both.

6. How is repair work documented? (i.e. work record, timecard) A repair/maintenance list is maintained by the Program Manager. This repair/maintenance list is added to annually by the bridge inspection teams during annual bridge inspections. The repairs and maintenance are done by the County Bridge Crew or Contract Labor depending upon the size and complexity of work needed. All repair/maintenance work is inspected by the Program Manager or a Team Leader prior to acceptance.

7. Who is empowered to order emergency road closures and how is it done? Jeremiah Upp, County Engineer; Bill Maravy, Deputy Engineer; and Eric McCrady, Deputy Engineer

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)** 235

2. Between 10' and 20' long (including 10' & 20') (ORC 5501.47, 5543.20) **(Metric 22)** 110

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: William Maravy, P.E., Deputy Engineer
- Yrs. Inspection related experience: 3 Years
- List courses attended (& approx dates):

  - ODOT Bridge Inspection Level I – 2017
  - ODOT Bridge Inspection Level II – 2017

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

- Name: William Maravy, P.E., Deputy Engineer
- Yrs. Inspection related experience: Same as above
- List courses attended (& approx dates): Same as above

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

- Name: Tim Anderson, Road and Bridge Inspector
- Yrs. Inspection related experience: 17 years
- List courses attended (& approx dates):

  - ODOT Bridge Inspection Level I – 2004
  - ODOT Bridge Inspection Level II – 2007
  - LTAP ODOT Manual of Bridge Inspection Update – 2011
  - FHWA-NHI-130078 Fracture Critical Techniques for Steel Bridges – 2013
  - LTAP ODOT Bridge Inspection Refresher Training - 2017

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

%TIME

_30%_ Bridge/Culvert inspection
_____Bridge Design/Plan prep
_30%_ Bridge Construction
_____Bridge Maintenance
_____ Overload/Superload
_____ Surveying
_40%_Other -
_____100%

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

- Name: Jennifer Donley

- Yrs. Inspection related experience: 14 years
- List courses attended (& approx dates):

- ODOT Bridge Inspection Level I – 2007
- ODOT Bridge Inspection Level II – 2007
- LTAP ODOT Manual of Bridge Inspection Update – 2011
- LTAP ODOT Bridge Inspection Refresher Training - 2017

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

%TIME

_25%___ Bridge/Culvert inspection	_____Overload/Superload
_25%___ Bridge Design/Plan prep	_15%_ Surveying
_25%___ Bridge Construction	_10%_ 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: Dustin Matthews
- Yrs. Inspection related experience: 6 years
- List courses attended (& approx dates)

- ODOT Bridge Inspection Level I – 2015
- ODOT Bridge Inspection Level II – 2015

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

%TIME

_25%__ Bridge/Culvert inspection	_____ Overload/Superload
_25%__ Bridge Design/Plan prep	_15%_ Surveying
_25%__ Bridge Construction	_10%_ 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)

Team Member

- Name: Jason Grubb
- Yrs. Inspection related experience: 2
- List courses attended (& approx dates)

- Indicate the percentage of time spent on the listed duties in the previous year
  - ODOT Bridge Inspection Level I – 2017
  - ODOT Bridge Inspection Level II – 2017

%TIME

5%__ Bridge/Culvert inspection	_____ Overload/Superload
_____ Bridge Design/Plan prep	_____ Surveying
_____ Bridge Construction	65% _ Other -
30%_ Bridge Maintenance	_____100%

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

a. List Ohio PE # 71811

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 Pick-up truck

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

	Yes/No		
Extension Ladder	_YES_	First Aid Kit	_YES_
what length?	_12' _	Wire Brush	_YES_
6' Folding Rule	_YES_	Calipers	_YES_
100' Fiberglass Tape	_YES_	Shovel	_YES_
Geologist Hammer	_YES_	Screwdriver	_YES_
Inspection Mirror	_YES_	Pliers	_YES_
Flashlight	_YES_	Wrenches	_YES_
Thermometer	_YES_	Sounding Chains	_YES_
Plumb Bob	_YES_	Hip Boots and Waders	_YES_
Camera	_YES_	Paint Stick/Crayon	_YES_
2'-0" Level	_YES_	Scraper	_YES_
Brush Hook/Axe	_YES_	Probing Rod	_YES_
Boat	_YES_	Vertical Clearance Rod	_YES_

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

None, Program Manager and one Team Leader have been trained in their use

4. How is usage determined? Based on need

5. List additional items N/A

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

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

D. INSPECTION PROCEDURES

1. Approximately how many inspections were made during last calendar year? (Metric 6) 345 based on a fiscal year. Inspections are done October through December every year.

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

3. Average number of inspections per day (Metric 6) 10

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

   a. Beam/Girder 15-45 minutes
   b. Slab 15-45 minutes
   c. Truss (pony/through/deck) 30-60 minutes
   d. Culvert 15-45 minutes

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: Currently using SMS, input data directly into SMS @ Bridge

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

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

   Are Bridge comments recorded? (Yes _X_ No ___) Where? Recorded on SMS and spreadsheet

Are bridge comments brought to the bridge? (Yes _X_ 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) Program Manager. Need is based upon the structural integrity of the bridge.

8. List bridges requiring inspection more frequently than one-year intervals (DAMAGE, IN-DEPTH, SPECIAL INSPECTIONS). List frequency of inspection. (Metric 11) Both BER-10 and BLO-09 are semiannually

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)

    The bridges are placed into four (4) different groups and each group is inspected by a different inspector on a rotating pattern each year. The Program Manager inspects a different group each year, which means he inspects all bridges on a 4-year cycle. If a bridge has a general appraisal of 4 or less for the first time, the Program Manager will do a field review of the inspection.

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) Yes

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 ___)

    In-Depth Inspections? (Yes _X_ No ___)

Underwater Inspections ? (Yes ___ No _X_)

Fracture Critical Inspections? (Yes _X_ No ___)

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

1. How many bridges are considered scour susceptible? (Type of Service over Water) None

2. How many bridges are inspected by probing? Varies, need is determined by Team Leader in the field.

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) N/A

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

6. How are scour evaluations performed? (Metric 18) N/A

7. Who determines the need for diving inspections and by what criteria? Program Manager – based on need

F. INVENTORY

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

2. How often is the inventory checked for needed updates? (Metric 22) When needed due to discrepancies discovered during inspections. When notified by CEAO or ODOT that an item needs checked.

3. How is the inventory data input into the system? SMS

4. When is the updated inventory data forwarded to ODOT? (Metric 23) 180 days

   Changes discovered during inspection? SMS

   Changes from new construction or rehab? SMS

5. NBIS requires that the inspecting organization maintain master lists of the following: (Provide a list of these bridges) (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) – In file and in Inspection Notebook with Inspectors in field

b. Bridges requiring underwater inspections N/A

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

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? (Y___ N_X_) On another form? (Yes _X_ No ___) **(Metric 15)**

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

   A spreadsheet/list is created and it is logged in our PubWorks. This list is then audited by the Program Manager and passed on to the bridge maintenance crew. Repairs are then inspected by the Program Manager and/or a Team Leader

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

   The Program Manager is notified, and it is logged in our PubWorks

   How is this emergency action documented? SMS and/or daily worksheets

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 placed on our bridge maintenance list in PubWorks and reported to the Program Manager.

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

   Bridge Inspection Crew and the Sign Crew

H. LOAD ANALYSIS AND POSTING

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

   In flat files and scanned on server – uncertain of the exact number

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

   In flat files and scanned on server – uncertain of the exact number

3. Number of bridges analyzed in accordance with the *AASHTO Manual for Bridge Evaluation* (Metric 13) All over 20' span

4. By Whom (Metric 13) Varies

5. When Varies

6. Methods used (Metric 13) Varies

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

   Bridges are rerated when bridges receive a General Appraisal rating of a 4 or less, or when the Program Manager thinks the structural integrity of a bridge dictates an analysis is needed. Bridges with overlays or other changes are analyzed by the Program Manager or a consultant as needed.

8. Number of NBIS length bridges not load rated (Metric 13) 0

9. List the NBIS length bridges considered "not ratable" including reason for being considered "not ratable" (Metric 13) 0

10. Number of NBIS length bridges load posted (Metric 14) 8

11. How determined (engineering judgment, analysis, mix) Varies

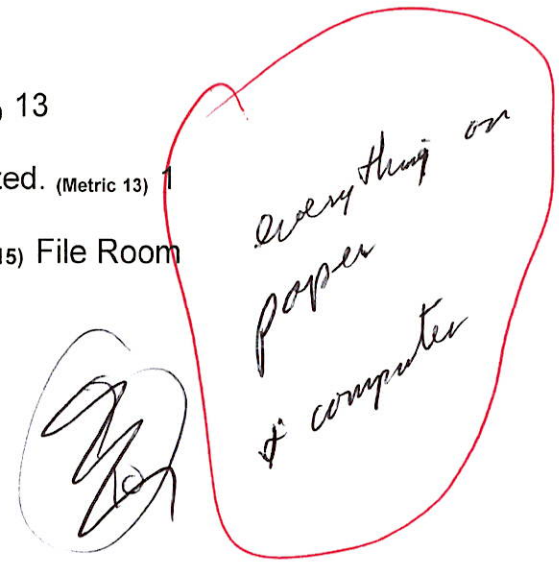
12. List bridges closed due to condition rating (rough check) 0

13. List bridges rated less than 100% Ohio legal load and not physically load posted, and resolution 0

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

15. Number of NBIS bridges with Gusset Plates analyzed. (Metric 13) 1

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



- 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

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)

All except 1 = 12 months
1 which requires a snooper = 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) N/A

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

22. List any complex bridges: (Metric 19) 0

23. Do the complex bridges require specialized inspection procedures and additional

inspector training? (Metric 19) (Yes ___ No _X_)

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.