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: Hancock County

Checklist completed by: Eric Barnes Date: 8/3/2020

I. MAINTENANCE, REHABILITATION AND REPLACEMENT PROGRAM

A. NUMBER OF BRIDGES WITH MAINTENANCE RESPONSIBILITY

1. Greater than 20' long (NBIS length 23CFR 650c) **(Metric 22)** 231

2. Bridges >= 10' and <= 20' long **(Metric 22)** 143

B. PROCEDURES AND BUDGET

1. Contract repairs and replacement
   - List typical work items Full bridge replacement over 30' span
   - List approximate annual budget +/-$1,000,000
   - Are Fed Funds used? Yes
   - Are Credit Bridge funds used? Yes

2. In-house repairs and replacements
   - List typical work items Guardrail repairs, patching of beams and concrete structures, minor paving repairs
   - List approximate annual budget +/-$100,000 to $200,000
   - List staffing availability Fully staffed Garage with Highway Maintenance Workers and 2 Roadway Superintendents

3. How are projects identified and selected? General Appraisal / Inspector recommendation

4. How are plans developed for emergency repairs? Severe= Design Firm, Moderate= Road Superintendent Input

5. Who does the work of emergency repairs? Severe= Contractor, Moderate= In-house Road Crew

6. How is repair work documented? (i.e. work record, time card) Bridge Inspector updates plans/data sheet. Enters data into appropriate AssetWise comments sections.

7. Who is empowered to order emergency road closures and how is it done? County Engineer handles emergency road closure. There is a meeting with the Roadway Superintendent, then closure information is phoned into Emergency Services, newspaper, radio, media, etc.

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) **(Metric 22)** 231

2. Between 10' and 20' long (including 10' & 20') (ORC 5501.47, 5543.20) **(Metric 22)** 143

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: Doug Cade
- Yrs. Inspection related experience: 9 Years, BS Civil Engineering 1993, PE and PS
- List courses attended (& approx dates) NBIS Level 1 and 2 in 2011, Bridge Inspection Refresher in 2015 and 2020

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

- Name: Doug Cade
- Yrs. Inspection related experience: 9 Years, BS Civil Engineering 1993, PE and PS
- List courses attended (& approx dates) NBIS Level 1 and 2 in 2011, Bridge Inspection Refresher in 2015 and 2020

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

- Name: Eric Barnes
- Yrs. Inspection related experience: B.S. in Civil Engineering from Ohio Northern University, EIT Certification, 3 years bridge inspection experience
- List courses attended (& approx dates): ODOT Bridge Inspection Training Level 1 (Aug 2018), ODOT Bridge Inspection Training Level 2 (Sept 2018)

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

%TIME

30% Bridge/Culvert inspection
10% Bridge Design/Plan prep
25% Bridge Construction
10% Bridge Maintenance
1% Overload/Superload
5% Surveying
19% Other - AssetWise
_____100%

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

- Name: N/A_____
- 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
_____ Bridge Design/Plan prep
_____ Bridge Construction
_____ Bridge Maintenance
_____ Overload/Superload
_____ Surveying
_____ Other -
_____100%

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

- Name: N/A _____
- 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
_____ Bridge Design/Plan prep
_____ Bridge Construction
_____ Bridge Maintenance
_____ Overload/Superload
_____ Surveying
_____ Other -
_____100%

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

- Name: N/A
_____
- 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
_____ Bridge Design/Plan prep
_____ Bridge Construction
_____ Bridge Maintenance
_____ Overload/Superload
_____ Surveying
_____ Other -
_____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: N/A _____
- 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
_____ Bridge Design/Plan prep
_____ Bridge Construction
_____ Bridge Maintenance
_____ Overload/Superload
_____ Surveying
_____ Other -
_____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: N/A _____
- 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
_____ 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: N/A _____
- 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

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

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

a. List Ohio PE # 63613

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

- Name: N/A _____
- 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	No - available	First Aid Kit	Yes
what length?	6’	Wire Brush	Yes
6’ Folding Rule	Yes	Calipers	Yes
100' Fiberglass Tape	Yes	Shovel	Yes
Geologist Hammer	Yes	Screw Driver	Yes
Inspection Mirror	Yes	Pliers	Yes
Flashlight	Yes	Wrenches	Yes
Thermometer	No - available	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 - reciprocating saw	Probing Rod	Yes
		Vertical Clearance Rod	Yes
Boat	No - available		

3. List types of NDT methods used (IE. dye penetrant, magnetic particle, ultrasound)
None – sounding chain used to sound concrete, chipping hammer used for knocking rust away.

4. How is usage determined? N/A

5. List additional items N/A

6. What equipment does your team have available for "hands on" access to FCM bridge members? **(Metric 16)** 6' ladder is sufficient to inspect FCM

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

a. How many bridges need a snooper? None
b. How many bridges is it used on? None
c. How often? N/A

D. INSPECTION PROCEDURES

1. Approximately how many inspections were made during last calendar year? **(Metric 6)**
374
2. Approximately how many inspections are scheduled for the current calendar year? **(Metric 6)**
374
3. Average number of inspections per day **(Metric 6)**
7 – depends on size and weather conditions
4. Approximately how long (hours) does it take to inspect average sized structures

a. Beam/Girder 1 hour
b. Slab 1 hour
c. Truss (pony/through/deck) 1 hour
d. Culvert 0.25 hour

5. Are previous inspection reports available at site for review? Yes **(Metric 15)**

Are bridge inspections recorded in field on paper or electronically? Please describe: All inspections/ comments are documented on paper. Photos are taken at each bridge. Comments and photos are then transferred to our county database and to AssetWise.

Are photos available for every bridge? Yes

Are photographs taken of defects during inspection? Yes

Are Bridge comments recorded? Yes Where? Comments are recorded on paper, then transferred to our county database and in to AssetWise

Are bridge comments brought to the bridge? Yes

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, on a laptop in PDF format

b. Bridge office Yes

7. Who determines the need for a routine inspection frequency greater than once Annually, and what criteria is used? **(Metric 6)** Routine Inspections are performed once a year unless otherwise directed by the County Engineer

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

10. What kinds of quality assurance checks are made of the inspection process? **(Metric 20)**
Annual review by County Engineer

11. Do any bridges have underwater inspections done in less than 60 month intervals? **(Metric 8)**
No Underwater Inspections are needed in Hancock County

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, all bridges are inspected at a maximum of 12 month intervals

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

Routine Annual Inspections? Yes

Special Inspections? Yes

Underwater Inspections? N/A

Fracture Critical Inspections? Yes

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

1. How many bridges are considered scour susceptible? (Type of Service over Water)
374
2. How many bridges are inspected by probing?
374, however all bridge foundations and pier can be seen at low water levels
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)** Either by visual inspection or by probing

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

F. INVENTORY

1. What kinds of inventory quality assurance checks are performed? **(Metric 22)**
Annual Review by County Engineer

2. How often is the inventory checked for needed updates? **(Metric 22)**
At the time of input into AssetWise

3. How is the inventory data input into the system? Directly through AssetWise

4. When is the updated inventory data forwarded to ODOT? **(Metric 23)**
After approval from the County Engineer

Changes discovered during inspection? Input and submitted through AssetWise

Changes from new construction or rehab? Input and submitted through AssetWise

5. NBIS requires that the inspecting organization maintain master lists of the following: (Provide a list of these bridges) **(Metric 16,17,11)**
SFN: 3230538, 3231666, 3233189, 3233863. FCM written plans on file for these structures.

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 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 during bridge inspection? **(Metric 15)** Yes

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

3. Who do the inspectors notify when emergency repairs or critical findings are necessary (action required within 1 week)? **(Metric 21)** A meeting is scheduled with the County Engineer and Roadway Superintendent to discuss the necessary action

How is this emergency action documented?
Action is recorded in County database and in AssetWise, and if necessary on the plans

4. If a bridge requires emergency repairs, is this noted as part of the inspection report or as a separate document? **(Metric 21)** Typically on the inspection report. Additional documentation may be utilized depending on the severity of the situation

5. Who checks proper placement of signs (load posting, clearance, speed restriction, narrow bridge etc.)? **(Metric 15)** The in-house sign crew handles sign location/ replacement. If a change is necessary, a conversation would happen between the County Engineer and the sign crew.

H. LOAD ANALYSIS AND POSTING

1. Number of plans for existing bridges available for NBIS length bridges 203

2. Number of plans for non-NBIS bridges (>= 10’ and <= 20' long) 39

3. Number of bridges analyzed in accordance with the *AASHTO Manual for Bridge*

Evaluation **(Metric 13)** LFR or LRFD method. Currently in the process of load rating bridges using the AASHTO Ware BrB software.

4. By Whom **(Metric 13)** Eric Barnes, then reviewed by Doug Cade

5. When Dates are shown on all load rating sheets

6. Methods used **(Metric 13)** Mostly ODOT spreadsheets, though working on load rating using AASHTO Ware BrR software.

7. When are bridges rerated and how do load raters keep up with overlays and other changes? **(Metric 13)** We look at the list of roads being paved each year and see if there are any bridge on the corresponding roads. Before we pave, we reload rate the bridges to make sure the additional asphalt will not cause any structural issues.

8. Number of NBIS length bridges not load rated **(Metric 13)** 16, only missing EV load ratings, will be completed before the end of the year using AASHTO Ware

9. List the NBIS length bridges considered "not ratable" including reason for being considered "not ratable" **(Metric 13)** Non load ratable structures include those that fall under the BDM 910 "Structures Exempt from Load Rating"

10. Number of NBIS length bridges load posted **(Metric 14)** 22

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

12. List bridges closed due to condition rating (rough check) **2 structures Closed (T-84-1.20, T-38-0.52)**

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)** 3

15. Number of NBIS bridges with Gusset Plates analyzed. **(Metric 13)** 3

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

- Inspection reports, including old inspections — Server/ Vault/ AssetWise
- Design Calculations — Server
- Plans — Server/ Vault
- Load analysis calculations — Server/ Vault
- Inventory forms — Server/ Vault/ AssetWise
- Photos and sketches — Server/ Vault
- Repairs and maintenance history — Server
- Scour evaluation — Server
- Scour POA — N/A

- Fracture Critical File — Server/ AssetWise
- Load Posting/Closing — Server/ AssetWise
- Underwater inspections — N/A
- Special inspection eqpt. or procedures — Server/ AssetWise
- Flood data, waterway adequacy, channel cross sections — Server

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)** Annual – every 12 months

18. Is the FC Plan completed for all FC bridges? **(Metric 16)** Yes

19. Are the FCM Identified in the FC Plan? **(Metric 16)** Yes

20. What is the underwater inspection frequency? **(Metric 17)** N/A

21. Are the underwater elements identified and located? **(Metric 17)** N/A

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

23. Do the complex bridges require specialized inspection procedures and additional inspector training? **(Metric 19)** N/A

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. None