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:___Lorain County Engineer's Office_____

Checklist completed by: ___Shaun Duffala_____Date:__8/17/2020_____

I. MAINTENANCE, REHABILITATION AND REPLACEMENT PROGRAM

A. NUMBER OF BRIDGES WITH MAINTENANCE RESPONSIBILITY

1. Greater than 20' long (NBIS length 23CFR 650c) **(Metric 22)** **121**

2. Bridges >= 10' and <= 20' long **(Metric 22)** 111

B. PROCEDURES AND BUDGET

1. Contract repairs and replacement
   - List typical work items __Full replacements, superstructure replacements
   - List approximate annual budget - No set budget. Generally try to do 2-4 bridges (local funds/OPWC) a year on top of our Federally Funded structures
   - Are Fed Funds used? Yes
   - Are Credit Bridge funds used? Yes

2. In-house repairs and replacements
   - List typical work items - Superstructure replacements, cleaning channels, scour protection, deck repairs/replacements
   - List approximate annual budget - no defined budget to in house work
   - List staffing availability - no dedicated bridge crew, typically can have 3-8 workers as needed

3. How are projects identified and selected? List of items is developed after annual inspections are performed

4. How are plans developed for emergency repairs? In-house or through the use of general engineering services contracts

5. Who does the work of emergency repairs? Contractors and in-house depending on type of work

6. How is repair work documented? (i.e. work record, time card) dependent on type, but if in house it would be force account

7. Who is empowered to order emergency road closures and how is it done? Our office can order a road closed. Once determined it is needed, we contact our in house sign shop to place barricades and contact all local authorities

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)** **121**

2. Between 10' and 20' long (including 10' & 20') (ORC 5501.47, 5543.20) **(Metric 22)** 111

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: Shaun Duffala, P.E.
- Yrs. Inspection related experience: 4 years
- List courses attended (& approx dates) Bridge Inspector Level 1 (9-8-16), Level 2 (10-13-16), ODOT LTAP Refresher (3-21-19)

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

- Name: Robert Klaiber
- Yrs. Inspection related experience: 4

- List courses attended (& approx dates) _Mr. Klaiber is a PE.

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

- Name: _Shaun Duffala
- 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%

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) _____
_____
_____

- 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: _____
- 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: _____
- 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: _____
- 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: _____
- 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: _____
- 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)**

a. List Ohio PE # 79672

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

- Name: Contracted out (last time GPI performed inspection)
- Yrs. Inspection related experience: _____
- List courses attended (& approx dates) _____
_____
_____

C. INSPECTION EQUIPMENT

1. Type of vehicle used for inspections – F350

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

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

3. List types of NDT methods used (IE. dye penetrant, magnetic particle, ultrasound) – none have been used on existing structures other than sounding since I have been here

4. How is usage determined?

5. List additional items

6. What equipment does your team have available for "hands on" access to FCM bridge members? **(Metric 16)**
Ladders are used to get within an arms reach when required. Consultants are also hired for some structures

7. Use of equipment **(Metric 16)**
   a. How many bridges need a snooper? 2-5 (3 are in good shape, but may need one someday)
   b. How many bridges is it used on? Has been used on 2 in the last 10 years
   c. How often? As needed. Try to go a max of 5 years apart

D. INSPECTION PROCEDURES

1. Approximately how many inspections were made during last calendar year? **(Metric 6)** **232**

2. Approximately how many inspections are scheduled for the current calendar year? **(Metric 6)** **232**

3. Average number of inspections per day **(Metric 6)** **8-12 if a full day is used and depends on GA, type, and proximity to each other.**

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

   a. Beam/Girder – 45 minutes
   b. Slab – 45 minutes
   c. Truss (pony/through/deck) – 1 hour
   d. Culvert – 30 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: Prior to assetwise the previous years inspection w/ in house notes are taken to bridge and markup up in the field. I believe this year will be setup slightly different since Assetwise requires fewer inputs, but will still be paper.

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

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

   Are Bridge comments recorded? (Yes ___ No ___) Where?

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)**

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 ___)

10. What kinds of quality assurance checks are made of the inspection process? **(Metric 20)**

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

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

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

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

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 X No ___)

Special Inspections? (Yes ___ No X)

Underwater Inspections? (Yes X No ___)

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)
Don't have a definitive number as to how many are scour susceptible

2. How many bridges are inspected by probing? Every bridge

3. How many structures are Scour Critical (item 113 - 3, 2, 1 or 0)? **(Metric 18)**
Don't have a definitive number as to how many are scour critical, but not many (possible that it is 0)

4. Are Plans of Action (POA) complete and implemented for all bridges coded "Scour Critical"? **(Metric 18)** **N/a. Only cross sections we have done are on E 31st Bridge since it needs to be dived.**

5. How many structures are coded 6 on item 113 Scour Critical? **(Metric 18)**
Don't have a definitive number

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

7. Who determines the need for diving inspections and by what criteria?
I do. If we aren't able to probe within a 3 year period it is to be done by diving.

F. INVENTORY

1. What kinds of inventory quality assurance checks are performed? **(Metric 22)**
No specific checks in place. I review inventory as I am doing inspections.

2. How often is the inventory checked for needed updates? **(Metric 22)**
We do not check for updates. I generally update them when putting in inspections or as directed by Mark Stockman.

3. How is the inventory data input into the system?
I put in inventory data using the Edit Asset Value tab usually based on plan data. If no data is available I usually have a consultant input inventory.

4. When is the updated inventory data forwarded to ODOT? **(Metric 23)** **When requesting to make the structure active. Other than that, I do not think I have ever sent ODOT inventory data**

Changes discovered during inspection? Updated when putting in new inspection

Changes from new construction or rehab? Updated when putting in new inspection

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) **Pony Truss FCM's – Floorbeams, Lower Chord, Truss Diagonals**

b. Bridges requiring underwater inspections **E 31st St #0069 (4735072)**

c. Bridges with unique or special features (i.e., pin & hanger, draw, suspension) **Dean Rd #0103 (4734734)**

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_X_N___) **(Metric 15)**

2. How do the inspectors inform maintenance personnel of routine bridge maintenance problems (written, oral, other)? **(Metric 15)** Written work orders are sent over yearly

3. Who do the inspectors notify when emergency repairs or critical findings are necessary (action required within 1 week)? **(Metric 21)** County Engineer, Assistant County Engineer, and Road Superintendent

How is this emergency action documented? Critical Findings on Assetwise

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

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

H. LOAD ANALYSIS AND POSTING

1. Number of plans for existing bridges available for NBIS length bridges
Don't have an actual number, but most plans are available through our OnBase storage system. Hard copies are not kept in individual files

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

3. Number of bridges analyzed in accordance with the *AASHTO Manual for Bridge Evaluation* **(Metric 13)**
Not sure what this is. All requirements from ODOT are met to my knowledge.

4. By Whom **(Metric 13)**

5. When

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

7. When are bridges rerated and how do load raters keep up with overlays and other changes? **(Metric 13)**
Bridges are re-rated based on GA (new 5's) or as required for new vehicles which seems to be much more often.

8. Number of NBIS length bridges not load rated **(Metric 13)**
All NBIS bridges have been load rated

9. List the NBIS length bridges considered "not ratable" including reason for being considered "not ratable" **(Metric 13)**
All of our sandstone arches have been rated using "Engineering Judgement"

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

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

12. List bridges closed due to condition rating (rough check)
Whitney Rd #0291 (was closed due to condition, but is under construction)
Waterfall Drive #0017 (closed also to damn being removed to west)
Oberlin Elyria #0525 (never going to re-open but on Historic Registry. Oberlin Elyria was re-routed)

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)**
11 total

15. Number of NBIS bridges with Gusset Plates analyzed. **(Metric 13)**
Done as part of load rating, so all have been analyzed

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

- Inspection reports, including old inspections - hard copies in office and electronic
- Design Calculations - hard copies in office and electronic
- Plans - electronic
- Load analysis calculations - hard copies in office and electronic
- Inventory forms - electronic
- Photos and sketches - electronic
- Repairs and maintenance history - hard copies in office
- Scour evaluation – done as part of inspection so hard copies in office and electronic
- Scour POA – n/a no structures qualify to my knowledge
- Fracture Critical File – no separate file, if a FC inspection is done it is noted that way and put in the file
- Load Posting/Closing – no separate file, list generated from Assetwise and reviewed periodically
- Underwater inspections - hard copies in office and electronic
- Special inspection eqpt. or procedures – no file for this
- Flood data, waterway adequacy, channel cross sections - hard copies in office and electronic

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)**
1-2 years

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

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

20. What is the underwater inspection frequency? **(Metric 17)**
As required, I believe 5 years

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:

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.

Perform inspection with 2 people whenever possible