

# 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: Franklin County Engineer's Office

Checklist completed by: David Dibling Date: 12/11/2020

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

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

1. Greater than 20' long (NBIS length 23CFR 650c) (Metric 22) 180
2. Bridges  $\geq 10'$  and  $\leq 20'$  long (Metric 22) 180

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

#### 1. Contract repairs and replacement

- List typical work items Bridge replacement/rehab, joint replacements
- List approximate annual budget Varies - 2020 = \$8.4M / 2021 = \$6.6M / 2022 = \$10.5M
- Are Fed Funds used? Yes
- Are Credit Bridge funds used? Yes

#### 2. In-house repairs and replacements

- List typical work items Scour repair, culvert invert lining, superstructure replacement, precast deck slabs, deck patching, concrete deck & sidewalk sealing, drift removal, reset bearings, full box replacements (if small enough)
- List approximate annual budget N/A
- List staffing availability 2 bridge maintenance crews consisting of 2 supervisors and 8 workers

#### 3. How are projects identified and selected?

CIP projects are based off of ratings, when they become a 4 they are programmed for replacement. In-house projects are selected based on cost and if the bridge can be rehabed to a higher rating.

#### 4. How are plans developed for emergency repairs?

If it was a small project, we would develop the plans in house. We always have general engineering services contracts open with consultants who could be assigned an emergency repair if it was beyond what our office could handle.

5. Who does the work of emergency repairs?

Our maintenance crews if the fix is within thier scope otherwise we will use a contractor currently under contract for a construction job.

6. How is repair work documented? (i.e. work record, time card)

They used to be documented on the bridge card or in a spreadsheet . We have recently changed to a GIS system that will document repair work

7. Who is empowered to order emergency road closures and how is it done?

The County Engineer - The Bridge Engineer can make this happen with the blessing of the Chief Deputy who can act on behalf of the County Engineer. The process would be coordinated through our Mobility Department, First Responder Liaison and the Director of Communications. These departments provide MOT and coordination with affected agencies, emergency, law enforcement, schools, and the public. Projects are then declared an Emergency through Commissioner legislation.

**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) 180

2. Between 10’ and 20’ long (including 10’ & 20’) (ORC 5501.47, 5543.20) (Metric 22) 180

**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: Ed Herrick

- Yrs. Inspection related experience: ~20

- List courses attended (& approx dates) Bridge Inspection Level 1 & 2 (2008) , SMS Refresher (2013), Bridge Inspection Refresher Element Level (2015), Bridge Inspection Refresher (2017)

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

(Metric 1)

- Name: Ed Herrick

- Yrs. Inspection related experience: ~20

- List courses attended (& approx dates) Bridge Inspection Level 1 & 2 (2008) , SMS Refresher (2013), Bridge Inspection Refresher Element Level (2015), Bridge Inspection Refresher (2017)

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

(Metric 1&3)

- Name: Ed Herrick

- Yrs. Inspection related experience: ~20
  - List courses attended (& approx dates) Bridge Inspection Level 1 & 2 (2008) , SMS Refresher (2013), Bridge Inspection Refresher Element Level (2015), Bridge Inspection Refresher (2017)
- 

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

%TIME

<u>10%</u> Bridge/Culvert inspection	<u>0%</u> Surveying
<u>40%</u> Bridge Design/Plan prep	<u>40%</u> Other - Admin/Planning & Programming
<u>0%</u> Bridge Construction	<u>100%</u>
<u>10%</u> Bridge Maintenance	
<u>0%</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: David Dibling
  - Yrs. Inspection related experience: 8
  - List courses attended (& approx dates) Bridge Inspection Level 1 & 2 (2013) , Bridge Inspection Refresher Element Level (2015), Bridge Inspection Refresher (2017), Culvert Inventory & Inspection Class (2017)
- 

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

%TIME

<u>40%</u> Bridge/Culvert inspection	<u>5%</u> Overload/Superload
<u>50%</u> Bridge Design/Plan prep	<u>0%</u> Surveying
<u>0%</u> Bridge Construction	<u>5%</u> Other -
<u>0%</u> Bridge Maintenance	<u>100%</u>

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

(Metric 1&3)

- Name: Matt Balster
  - Yrs. Inspection related experience: 9
  - List courses attended (& approx dates) Bridge Inspection Level 1 & 2 (2011) , Bridge Inspection Refresher (2017)
- 

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

%TIME

<u>0%</u> Bridge/Culvert inspection	<u>0%</u> Overload/Superload
<u>0%</u> Bridge Design/Plan prep	<u>0%</u> Surveying
<u>70%</u> Bridge Construction	<u>30%</u> Other - Roadway/Drainage Construction
<u>0%</u> Bridge Maintenance	<u>100%</u> Inspection%

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

(Metric 1&3)

- Name: NA
- 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%

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: Joel Moehrman
- Yrs. Inspection related experience: 0
- List courses attended (& approx dates) None

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

%TIME Hired Full time in May 2020

<u>0%</u> Bridge/Culvert inspection	<u>0%</u> Bridge Maintenance
<u>0%</u> Bridge Design/Plan prep	<u>5%</u> Overload/Superload
<u>50%</u> Bridge Construction	<u>0%</u> Surveying

5% 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: NA
- 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: NA
- 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) David Dibling

- a. List Ohio PE # 81809

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

Ford F150

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

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

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

N/A

4. How is usage determined?

N/A

5. List additional items

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

We only have 1 fracture critical bridge and our bridge maintenance department uses power tools to open a ground level door to check the fracture critical member.

7. Use of equipment (Metric 16)

a. How many bridges need a snooper? 52

b. How many bridges is it used on? 49

c. How often? Every 5 years. However with ODOT's limited availability and some of our structures showing no signs of deterioration from the ground, that time can be extended.

## D. INSPECTION PROCEDURES

1. Approximately how many inspections were made during last calendar year? (Metric 6)  
368 (9 are cursory RR bridges over FCE road)

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

369 (9 are cursory RR bridges over FCE road)

3. Average number of inspections per day (Metric 6) 5-6

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

a. Beam/Girder 1.5 hour

b. Slab 1.5 hour

c. Truss (pony/through/deck) N/A

d. Culvert 0.5 hour

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: Electronically though a tablet and the AssetWise website

Are photos available for every bridge? (Yes  No  )

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

Are Bridge comments recorded? (Yes  No  ) Where? In the AssetWise comment box

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  ) We use Sharefile to access our plans remotely, they are also in Assetwise

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)

The Team Leaders will make that decision. Rate of deterioration and type of material are the criteria

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

N/A

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)

A PE reviews all reports, even if a PE is the inspector. A PE cannot approve his own report.

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)

No

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  No  )

Routine Annual Inspections? (Yes  No  )

Special Inspections? (Yes  No  )

Underwater Inspections? (Yes  No  )

Fracture Critical Inspections? (Yes  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) 349

2. How many bridges are inspected by probing?

All that don't require underwater inspections

3. How many structures are Scour Critical (item 113 - 3, 2, 1 or 0)? (Metric 18)

1 - 2534673

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)

0

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

Visual, probing, survey rod, or underwater inspections

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

Ed Herrick or David Dibling. Depth of water, an unknown footing height, alarming change in scour from previous years inspection that is no longer accessible.



## F. INVENTORY

1. What kinds of inventory quality assurance checks are performed? (Metric 22)  
Inventory items are checked/updated during annual inspections.
  2. How often is the inventory checked for needed updates? (Metric 22)  
Annually or when maintenance/construction on the bridge occurs.
  3. How is the inventory data input into the system?  
AssetWise with plan/field information
  4. When is the updated inventory data forwarded to ODOT? (Metric 23)  
Whenever it changes within the AssetWise  
Changes discovered during inspection?  
Changes are made in the inspection on the tablet and when the report is approved, it updates in AssetWise  
Changes from new construction or rehab?  
Changes are made before the new construction or rehab opens to traffic. They are made so the bridge can then be inspected before it opens to traffic.
  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)  
BRO-C0150-0000 (Beach Rd)
    - b. Bridges requiring underwater inspections  
BLE-C0020-0273 (Smothers Rd), NOR-C0032-0674 (Hayden Run), NOR-C0052-0046 (Fishinger)
    - c. Bridges with unique or special features (i.e., pin & hanger, draw, suspension)  
BRO-C0150-0000 (Beach Rd), CLI-C0059-0318 (Lane Ave)
- Note: An examination of the files will be performed during the review.**  
BRO-C0150-0000 (Beach Rd), CLI-C0059-0318 (Lane Ave)

- 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) Excel List

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

How is this emergency action documented? [Critical Finding report would be filed. Otherwise it is documented through emails and OneNote](#)

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 documented in the report and through emails and OneNote](#)

5. Who checks proper placement of signs (load posting, clearance, speed restriction, narrow bridge etc.)? (Metric 15) [The bridge inspector or mobility department](#)

## H. LOAD ANALYSIS AND POSTING

1. Number of plans for existing bridges available for NBIS length bridges  
[164](#)

2. Number of plans for non-NBIS bridges ( $\geq 10'$  and  $\leq 20'$  long)  
[143](#)

3. Number of bridges analyzed in accordance with the *AASHTO Manual for Bridge Evaluation* (Metric 13)  
[269 - from SMS, Item 63 and 65 do not equal 5](#)

4. By Whom (Metric 13)  
[David Dibling, Ed Herrick, Consultants](#)

5. When  
[New construction, rehab, overlay, or after inspection findings.](#)

6. Methods used (Metric 13)  
[BrR, BRASS](#)

7. When are bridges rerated and how do load raters keep up with overlays and other changes? (Metric 13)  
[Rehab, overlay, or after inspection findings. - Our reasurfacing department informs us of planned overlays](#)

8. Number of NBIS length bridges not load rated (Metric 13)  
[16 - Load rated using engineers judgment\(No Plans\) - good 5](#)

9. List the NBIS length bridges considered "not ratable" including reason for being considered "not ratable" (Metric 13) [2531542, 2531585, 2535459, 2533421, 2533006, 2531615, 2532115, 2532115, 2531992, 2535327, 2535580, 2535483, 2535084, 2536080, 2535602, 2533243, & 2535130 - No Plans](#)

10. Number of NBIS length bridges load posted (Metric 14)  
[1](#)

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

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)  
[0](#)

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

N/A

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

Almost all of our files exist on our network drives in their individual bridge folder. Older (pre-SMS) inspection reports can be found in our file cabinets.

- Inspection reports, including old inspections individual network folder, old reports are in filing cabinet and SMS
- Design Calculations individual network folder
- Plans individual network folder, Assetwise, FC GIS
- Load analysis calculations individual network folder, BrR
- Inventory forms individual network folder
- Photos and sketches individual network folder, SMS, AssetWise
- Repairs and maintenance history Old index cards, new maintenance in FC GIS
- Scour evaluation individual network folder, filing cabinet
- Scour POA individual network folder
- Fracture Critical File individual network folder
- Load Posting/Closing individual network folder
- Underwater inspections individual network folder
- Special inspection eqpt. or procedures individual network folder
- Flood data, waterway adequacy, channel cross sections individual network folder

**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)

2 years

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

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

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

5 years

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

22. List any complex bridges: (Metric 19)

BRO-C0150-0000 (Beach Rd), CLI-C0059-0318 (Lane Ave)

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

Describe:

Inspectors are to be certified bridge inspectors by ODOT and are to be up to date with current metric and inspection procedures. No additional training is required.

## **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.